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MAY 1934

FOOD INDUSTRIES

THE NEWS OF • PRODUCTION • ENGINEERING • DISTRIBUTION

END OF THE OPEN SHOP

Industrial relations — another name for labor problems — will become a potent factor in food manufacture if the Wagner Bill is passed.

Its enactment forecasts the end of the open shop, which, heretofore, has characterized the food industries.

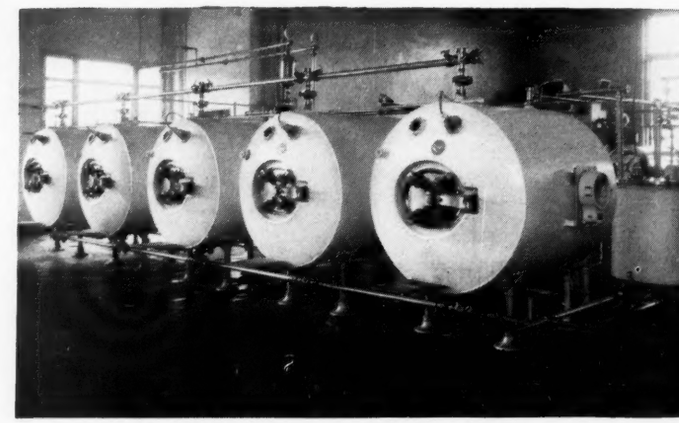
In learning the newer technique of management, a distinct advantage will lie with those who have served their apprenticeship in human relations by starting at the bottom —and have not forgotten their early experiences.

MAY 1934

McGRAW-HILL PUBLISHING COMPANY, INC.

OYSTERS—*Cleaning with chlorinated water under pressure*

BREAD—*HTH prevents mold and rope spoilage in scores of bakeries*



MILK—*HTH spray keeps down bacteria counts in dairy plants*

For Low-Cost Quality Insurance...

USE **HTH** ON ALL YOUR FOOD HANDLING SURFACES

YOU can build a new plant with insurance money *after* trouble occurs, but you can't build a new reputation that way.

That's why so many leading food manufacturers have adopted the "quality insurance" that only *micro*-cleanliness with HTH can provide. They find that it pays dividends every day by *preventing* trouble before it occurs.

HTH is a concentrated powder for making chlorine sterilizing solutions—the only kind of a bactericide and fungicide (except steam) that's safe for use on food equipment. Unlike steam, HTH solutions cause no expansion strains—there are no living bacteria left behind due to rapid condensation on cool surfaces—no danger of scalding and added dampness around the plant.

One 4-lb. can of HTH makes 3,000 gallons of a germ-killing solution of 100 parts per million available chlorine—a non-poisonous rinse that leaves no objectionable taste or odor. One manufacturer found that 33 cents' worth of hypochlorite per day did a better sterilizing job than steam costing $2.75 in fuel consumption—a daily saving of $2.42!

Read the list below. It shows how widely HTH is being used throughout the food industries. If you've never tried chemical sterilization with HTH, ask your supply house to send you a trial case of a dozen 4-lb. cans to make a thorough test.

HTH
A stable and efficient chlorine-carrier for convenient application as a
Bleach · Germicide · Bactericide
Disinfectant · Deodorant
Fungicide
This package is an accurately-measured unit containing not less than 4 lbs. of available chlorine.
Manufactured by
The MATHIESON ALKALI WORKS Inc.
250 Park Avenue, New York, N.Y.
U.S.A.

The* MATHIESON ALKALI WORKS *(Inc.)
250 Park Avenue **New York, N.Y.**

Soda Ash . . . Liquid Chlorine . . . Bicarbonate of Soda . . . HTH and HTH-15 . . . Caustic Soda . . . Bleaching Powder . . . Ammonia, Anhydrous and Aqua . . . PH-Plus (Fused Alkali) . . . Solid Carbon Dioxide.

• • •

HTH is a highly concentrated calcium hypochlorite for making germicidal solutions, either alone or in combination with soda ash. HTH is packed in 4-lb. cans, one dozen to the case. Each can makes 30 gallons of a concentrated supply solution, containing 1% of available chlorine, at a cost of about 5¢ per gallon.

HTH Sanitation is steadily becoming the standard practise with these producers of food products:

Bakeries	Distilleries
Bottling Plants	Fish Packing Plants
Breweries	Ice Plants
Canneries	Ice Cream Plants
Cheese Plants	Meat Plants
Creameries	Milk Plants

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FOOD INDUSTRIES

NEWS OF PRODUCTION • ENGINEERING • DISTRIBUTION

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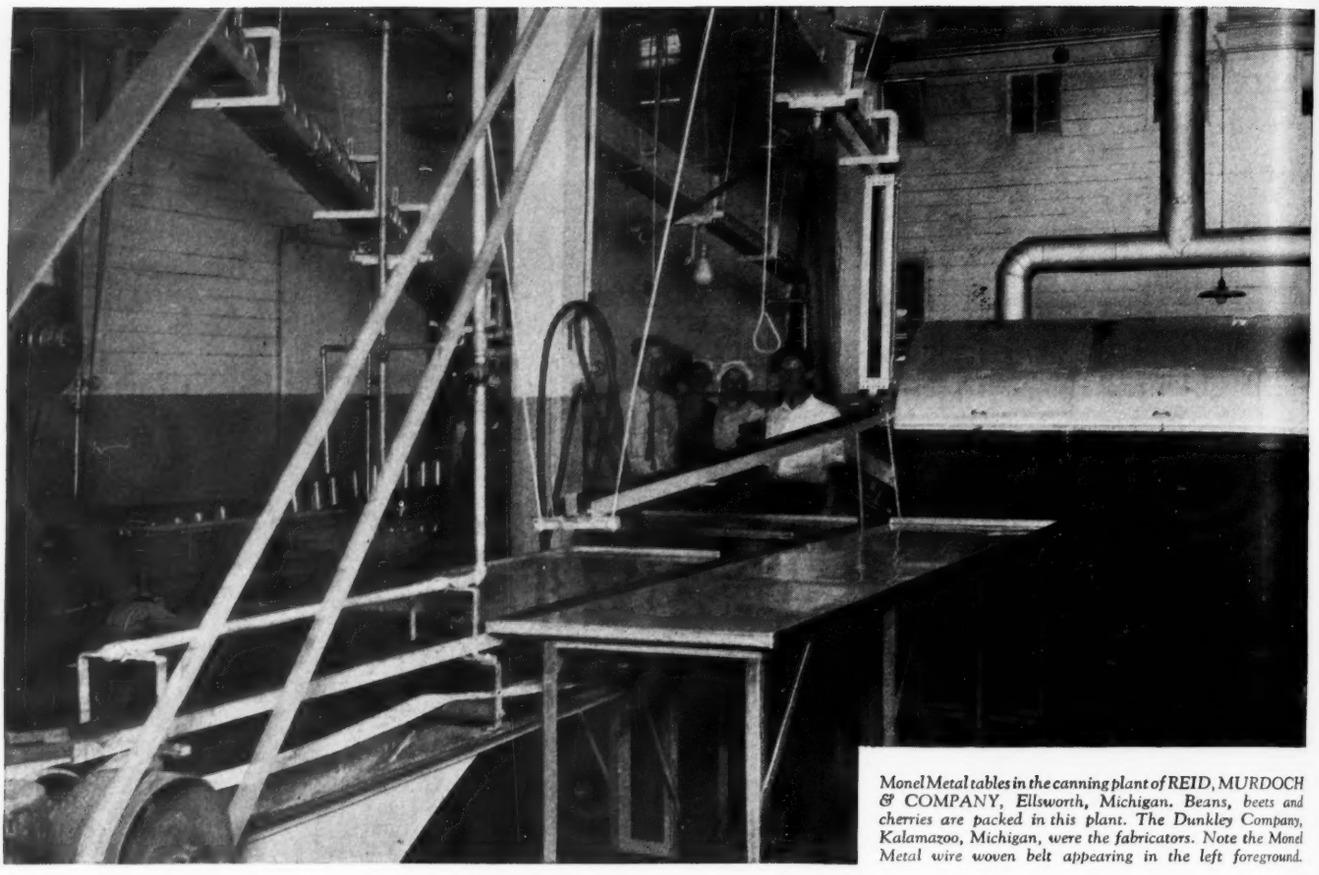


Monel Metal tables in the canning plant of REID, MURDOCH & COMPANY, Ellsworth, Michigan. Beans, beets and cherries are packed in this plant. The Dunkley Company, Kalamazoo, Michigan, were the fabricators. Note the Monel Metal wire woven belt appearing in the left foreground.

NOTHING *can be* TOO CLEAN FOR A *CANNER!*

Monel Metal equipment makes it possible to have the spotless work surfaces that prevent contamination.

A BIG PACKER once said, "For us, we reverse the usual...and rate Godliness as next to cleanliness."

"Dirt...from any source...cost us too much. In spoilage. In impaired flavor. In grief and trouble."

And so Monel Metal, which helps to keep contamination from ever getting a start, is finding more and more uses in the food industry. See how it works out:

Any rust spot provides a grand parking spot for dirt. (You know it's almost impossible to get rusted equipment really *clean*.) Monel Metal is absolutely proof against rust. It stubbornly resists corrosion, even by the brine solutions often used in food plants.

Because of its permanently smooth surface, Monel Metal provides no cracks or crevices that can harbor dirt or bacteria. Furthermore, Monel's dense, hard, smooth surface is relatively easy to clean. Result: a high degree of protection from contamination for fruits, vegetables, meats or sea-foods that are handled on it.

Monel Metal is so strong, so tough, so little affected by corrosion, and so immune to abrasive wear that repairs and replacements are practically eliminated.

Is it surprising that Monel Metal is being adopted by so many leading packers and canners? And for so many different uses:

Tables	Trucks
Chutes	Hoppers
Filling Machinery Parts	Conveyors
Tanks	Aprons
Mixers	Heating Coils
Screens	Filter Cloth
Pulpers	Finishers
Perforated Sheet	Piping and
Utensils	Fittings
Pump Rods	Accessories

Woven wire conveyor belting as in Dunkley cherry pitting machine, (see illustration above.)

For detailed information about any of these applications, write. Ask for a copy of "The Use of Monel Metal and Nickel in Food Packing Plants." Address

THE INTERNATIONAL NICKEL CO., INC., 67 Wall Street, New York, N. Y.

Monel Metal

MONEL METAL

Monel Metal is a registered trademark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

FOOD INDUSTRIES

THE NEWS OF • PRODUCTION • ENGINEERING • DISTRIBUTION

Established 1928—McGraw-Hill Publishing Company, Inc.
Volume 6 Number 5

New York, May, 1934 . . . Laurence V. Burton, Editor

THE CONSUMER

Who...May We Ask...Is He?

TODAY there is much glib talk about "the consumer." Both A.A.A. and N.R.A. provide official agencies to represent him. Neither clearly defines this man—or woman. For present purposes the dictionary is equally inadequate. A substitute definition must be offered.

• Today "the consumer" is every one of us. To speak of a distinct class under this designation is futile—even misleading. Only when one speaks with reference to an individual commodity at a particular stage of manufacture or trade does the term convey a useful meaning.

• Food industries can well study basic economic and social relations with reference to consumption. They will find out several interesting things. The food industries are consumers of agricultural materials; they also are consumers of one-third to one-half of their own products; and they are big consumers of many of the products of other industries.

• The inter-industry flow of commodities today is very complex. This is more true in the case of foodstuffs than of many other goods. Nearly 40 per cent of the value of the products of food factories goes to some other food manufacturer to become a raw material. One of the greatest markets which our industries have, therefore, is within our own group. Butter, flour, sugar, flavors, chocolate, and many other commodities could be named as examples. Almost every major division of food manufacture finds this situation in its distributing problem. Hence when we talk glibly of consumers we talk almost as much of ourselves as of the ultimate housewife and the family for which she buys at retail.

• Under these circumstances the self-appointed representatives of the consumer deserve relatively less attention than might at first seem proper. Furthermore, the price of goods to the ultimate consumer takes on a public concern in which we all share about equally. Again, it makes small difference whether this price be made up principally of raw-material cost and factory expense or if it includes even a considerable profit. All of the money involved in the ultimate price becomes available as public buying power either through wages, payment for raw material, or distribution in interest, dividend, or investment surplus. Only that becomes frozen which is held as cash surplus for mere liquidity of reserve.

• Socially speaking, profit ceases to have that tremendous concern which the self-appointed spokesmen of the consumer have attached to it. Good economists know this. We suspect that even the Brain Trust may become convinced of it shortly.

• None of these facts excuses attempts to make excessive profit, to secure unearned reserves, or to build up frozen cash reserves as a basis for corporate speculation. Management must discriminate carefully between the proper and the improper establishment of such funds. But today the interest of all the public is pretty nearly the same as that of the company itself.

• Clear thinking and a public-spirited approach to these problems are extremely important. Our industries can have both. Ultimately they will have it—under new managements if the present managements are unwilling to accept their share of responsibility. It will be better for all to get it through present managements rather than to force on our industry what should be needless public regulation.

AS IT LOOKS TO US

Are Manufacturers Profiteering? . . .

"Prices are running away from wages," says A.F. of L., and the so-called liberal press blames greed and profiteering.

Let us examine this idea. Almost every manufactured article that we buy is fabricated or composed of materials from a successive number of other ingredients. Each successive component carries increased costs in the form of higher taxes and wages, processing taxes and so on.

Costs pyramid. Wages do not.

It appears to be inevitable that prices will outdistance wages until natural economic adjustments shall take place.

Copper—Again . . .

Extremely minute traces of copper —one to six parts per million—in certain foods, as we stated editorially in January, 1934, FOOD INDUSTRIES, may be the cause of slight color changes in pickles, pork and beans, relishes, as well as slight harshness of flavor in certain sour condiments. Since then our correspondence has developed further information relative to the effects of copper.

Tomato products—even the very delicately flavored tomato juice—shows no color or flavor changes until the quantity of copper reaches a much higher figure—about 15 parts per million. Above that figure the bright red color of the tomato becomes slightly brownish red.

In order that there can be no misunderstanding on the part of our readers, we wish to emphasize that the best information available shows that for each of the various foods there seems to be a critical quantity of copper below which no visible effect is observable.

Of the possible sources of traces of copper, the raw materials and ingredients are as equally capable of being the cause of trouble as the equipment in which a food is manufactured. One cannot safely ascribe the cause of undesirable quantities of copper to any supposed cause without first making a careful laboratory study by competent chemists. To name any one raw material, or any piece of equipment, or material of construction without first making such a study is only to guess—and probably to guess wrong.

Whether a given quantity of copper may affect any food adversely or otherwise is a matter of determinable fact—not of opinion.

Date the Labels . . .

On account of the stringent character of the misbranding features of the proposed new food and drug law, for the next few years it will be most helpful to be able to show beyond the possibility of a doubt the exact date when labels were applied to any given product. Every manufacturer of non-perishable food products should immediately adopt and use a code of such identification on all labels.

The purpose of showing when labels were applied to products is a trifle different from the customary purpose of showing when goods were manufactured. There is no telling how long non-perishable goods may stay on store shelves and a manufacturer may easily become liable for difficulties of misbranding goods which were legal at the time they were made and shipped.

Rubber Hose . . .

Rubber manufacturers, so we are informed, are heaving big sighs of relief concurrently with the increase of alcoholic content of beer from 3.2 to 6 and even 9 per cent. Is it due to their particular fondness for bock? Not so, say they.

Such evident partiality to strong beer arises from another reason. Something which is termed "sludge" is said to form in rubber hose when 3.2 beer passes through it. The sludge, it is related, sometimes flushed out with the beer and made it very bitter. Complaints came from all parts of the country to the rubber-hose manufacturers, stating that the hose was wholly to blame. But now, since beer of higher alcoholic content is permissible, the trouble seems to have disappeared and the rubber man now has nothing to worry about but the mounting cost of crude rubber.

Price Fixing . . .

That the depression has existed most acutely in the capital or durable goods industries everybody knows. And everybody realizes that, despite the very evident improvement in business today, permanent recovery cannot be attained until capital goods are freely purchased.

Price fixing—i.e., code prohibitions against selling below cost—may be regarded as a fairly effective way to prolong this phase of the depression. Such a conclusion, unhappy though it may be, is inevitable if price levels are "frozen" high enough to allow inefficient and obsolete equipment to produce at a profit. The point at issue is the question of how much shall we pamper the high-cost producer?

The narrow view may be in favor of price fixing at inefficient levels, but the long-range view is in favor of compelling high-cost producers to become medium- or low-cost producers.

Better Pies . . .

Pie bakers can find a splendid example in the current efforts of the cake bakers to produce a factory-made product that is the equal of the home-made, if not its superior. Long ago, most commercial bread bakers surpassed the home bread baker. Cake bakers are well on their way. But the pie bakers as an industry have yet to become industry-conscious of their potential possibilities.

A greater reward for the pie baker is found in the pie that is good enough to demand 15 cents per cut than for the pie that has to be sold for a dime or less per cut. One hastens to admit, however, that not all 15-cent pies are worth 15 cents per cut.

Fillings which are what they are purported to be; "short" crusts made from fresh shortening really suitable

for pie making; and pies baked at the correct oven temperature in pans free from rancid grease are the indispensable bases upon which satisfied repeat business is built.

Our favorite lunch places are where such pies are obtainable.

Facts vs. Opinions . . .

Is the survey of buying intelligence of average Missouri housewives representative of the buying habits and psychology of the women of the entire nation? If so, then the professional spokesmen for the housewife and the self-appointed representatives of the "consumer" are faced with an extraordinary conflict of facts with their opinions.

Manufacturers in all lines will be astonished to learn how the conclusions of the Missouri studies, presented elsewhere in this issue, deviate from some popular notions.

Wagner Bill . . .

If the Wagner Bill is passed in its present form, it will impose not only collective bargaining with craft unions to a degree hardly contemplated under Section 7 (a) of N.I.R.A. but it will impose completely organized labor on all industry.

Should this come about, the food-manufacturing industries, which heretofore have been largely open shop, will almost automatically become closed shop. The relationship of employer to employee will be subject to constant interventions of outside third parties. Works councils and so-called company unions will be thrown out by Congressional fiat. Peaceful industrial families, which heretofore have been the rule in the food industries, will be organized from outside. Under such arrangement the employer's position is reduced almost to supine compliance.

No one who has not been through the mill and experienced all the griefs and responsibilities of management is capable of comprehending its problems. One who punches a time clock can go home at night, leaving his work behind him if he chooses, but not so the management.

Supporters of the Wagner Bill seem to believe that management and employers are a race of super-supermen who can extract money *ad lib.* from the public. Perhaps this is true in some industries, but certainly it is not true in the food industries.

If it should come to pass under the present form of the Wagner Bill that impossible wage demands are made, the union can order a strike and the management will have to like it. Indeed, under the bill a worker who replaces a striker is specifically restricted from being considered as an employee.

Something fundamental seems to be lacking in the philosophy of the Wagner Bill. If Congress is to impose the closed shop on all industry, if organized labor is to be thrust into open-shop industries, is it not reasonable that organized labor should likewise abandon the strike weapon and submit its differences with management to compulsory arbitration?

Chain Breweries Next . . .

With the advent of the greatly improved food technology of the past decade, it is now possible to manufacture brewers' syrup at central plants closely located to sources of raw materials. These syrups are then shipped in concentrated form to local breweries for fermentation, aging and ultimate distribution. The economics of this form of brewing enterprise appears to be all to the good. Most important of all is the elimination of the mashing operation and all of its attendant equipment and the voluminous space occupied.

When using a brewers' syrup, the brewer receives his raw material in tank cars, pumps it into the brew kettle, hops it, and then proceeds in the usual fashion. If carried to its logical conclusion, this trend will result in the development of many small breweries in localities where population density is not great enough to support large breweries. The limiting factor apparently will be the quality and quantity of the water supply.

Longer Growing Seasons

A tremendous concession has recently been made by the United States Weather Bureau, as is attested by the following quotation: "It appears . . . that the orthodox assumption of the stability of climate needs revision, and that our grandad was not so far wrong, as we have been wont to believe, in his statements about the exit of the old-fashioned winter of his boyhood days."

Since that statement was published before winter really started in, the next quotation may cause a smile, yet minor exceptions must not distract our attention from the broad trend. "All of these [calculations] confirm the general statement that we are in the midst of a period of abnormal warmth, which has come on more or less gradually for many years . . . The average length of the frost-free season (number of days from the last chilling frost of spring to the first in the fall) for the 20 years ending with 1906 was 188 days, and for a similar period ending with 1932 it had increased to 199 days."

For those who wish to make more detailed studies, the September, 1933, issue of *Monthly Weather Review* contains a great quantity of very interesting data. The increased length of the growing season by 5½ per cent is something of a new factor in current agricultural problems.

Why Continue Sulphuring? . . .

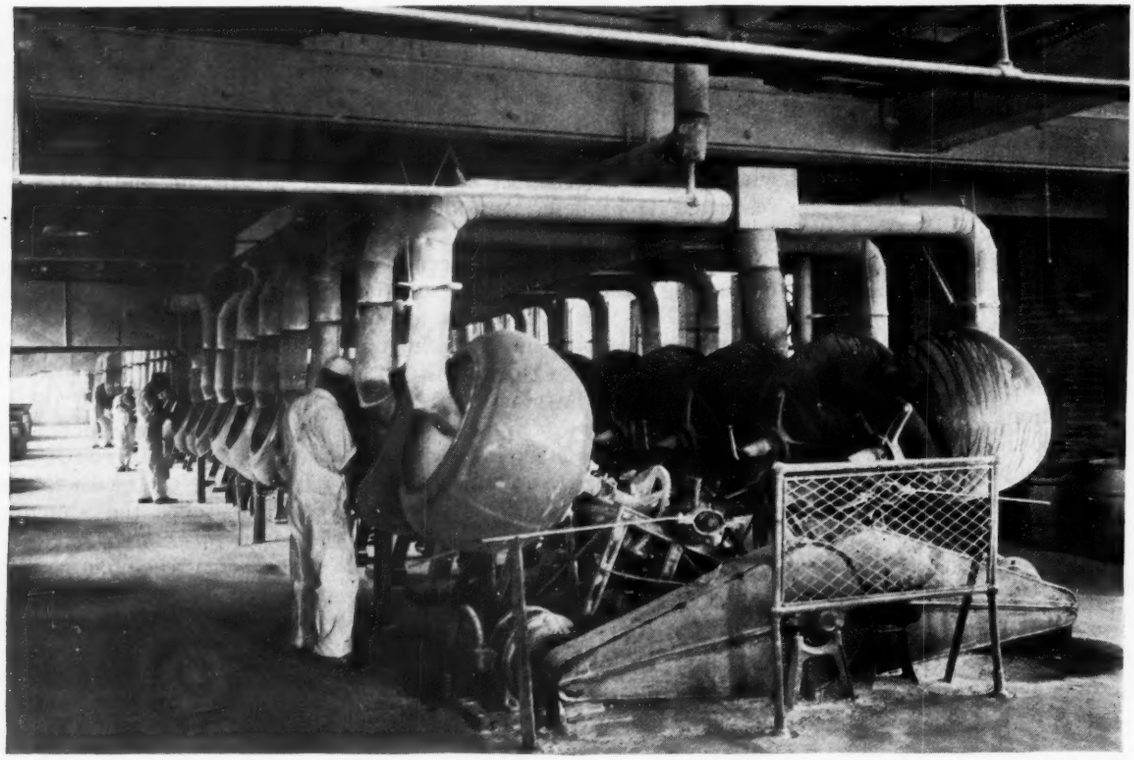
Readers who are engaged in the production of dried fruits must take cognizance of the rising consumer reaction against the use of sulphur dioxide in their products. The sensibleness or lack of it has nothing to do with the importance of the reaction. It is a fact with which to deal constructively, and nothing can be gained by delay.

The primitive methods employed for drying and sulphuring apricots, prunes, peaches and the like must be replaced by technical control or soon a disastrous situation will develop.

Primarily, this appears to be a task for the Agricultural Experiment Stations of the States involved, for the units engaged in this business seem to be too small to go in for the necessary research on their own. Secondarily, however, the situation calls for some sound educational work among the producers.

Consumers are being erroneously educated to believe that sulphuring has for its purpose the destruction of wormy infestation.

Two courses appear to be open: (1) To educate the consumer to utilize unsulphured fruits discolored by enzymic oxidation; the other to develop a method of treatment that will not require sulphur dioxide. The latter is the cheaper and more sensible.



Conditioned air is conducted through a single-pipe system to the 80-pan battery for sugar-coating chewing gum.

Putting On the Gloss

PAN-COATING . . . A Difficult Art . . . Has Never Been Wholly Mechanized or Standardized

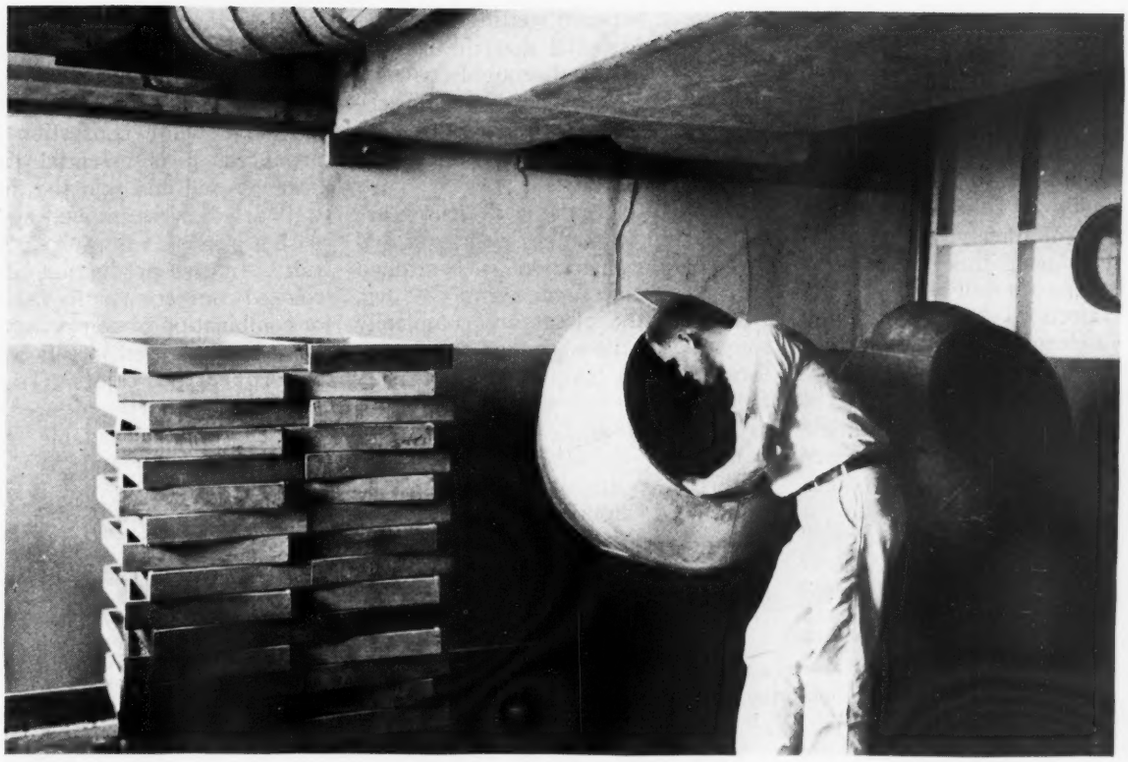
By K. A. BARTLETT
Works Manager
Health Products Corp.
Newark, N. J.

PAN COATING of nuts, candy, chewing gum and medicinal confections is an accomplishment that has to be obtained through a great amount of practical experience. Careful observance of conditions and methods of procedure which give best results, in order that they may be duplicated, is the secret of a successful operator's performance. As a result the appearance and the shelf-life of the finished product depend largely on the technique of the individual operator.

Certain general rules apply and must be followed. Those confections that are to be chocolate-coated and finished in revolving pans require quite different procedure from those that are to be given a coating of the sugar type. There are, however, points about the finishing of the sugar-coated confections that are worthy of consideration in connection with the finishing of chocolate-coated products. With both types of confections, the important factors are: type of coating pans used, speed at which these pans revolve, atmospheric conditions in the pan room with special regard to temperature and humidity, amount of air used, temperature of the air used at different stages in the coating operation, quantity of liquid used for each moistening, and period of time allowed for confections to dry between wettings.

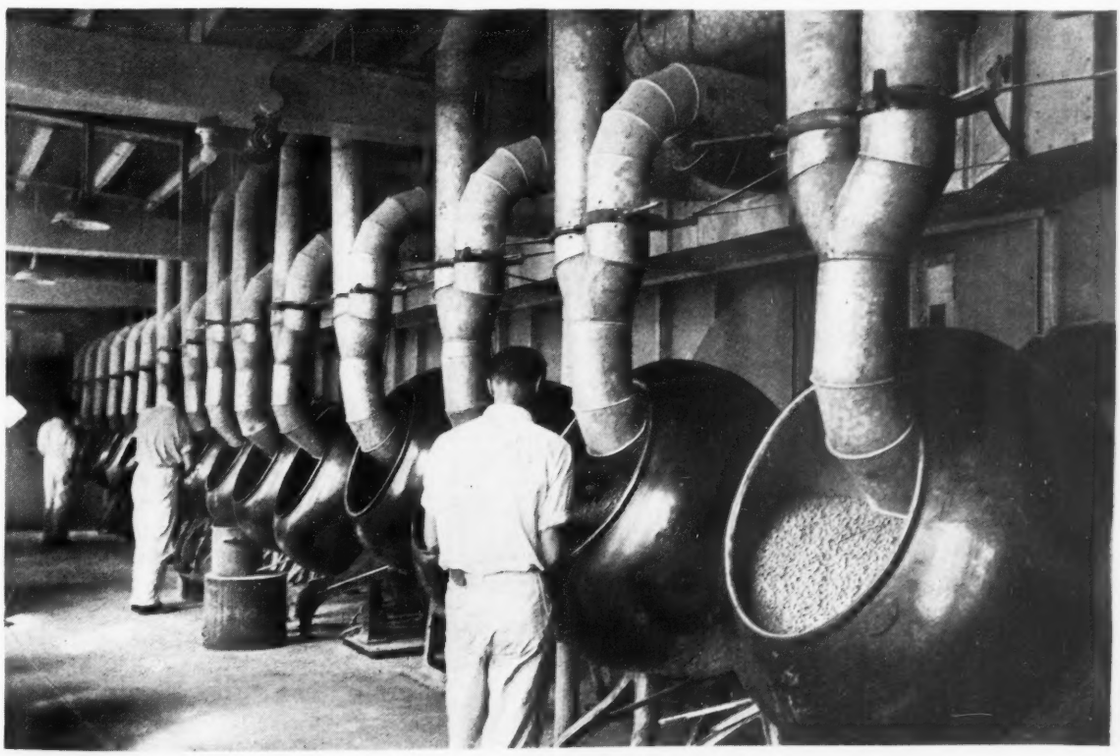
The humidity of the atmosphere directly affects the drying of the confection—so much so that it is not uncommon particularly in chocolate coating, for the production to be lowered 90 per cent on extremely humid days. In recent years some manufacturers have installed air-conditioning units to overcome this difficulty, and it is found that best results are obtained in sugar-coating when the temperature of the room is approximately 75 deg. F. and the relative humidity 35 per cent.

The first step in coating medicinal and similar types of confections consists of applying three or four portions of a 10 per cent gelatin solution mixed with equal volume of a 30-deg. Bé. sugar syrup. Flour or other



After being wax-polished in canvas-lined pans the confections are placed in wooden trays and left to dry for 24 hours or more before being packaged.

When air of different temperatures is required, as in the coating of medicated confections, a two-pipe air-conditioning system is advantageous. Regulation of temperature of mixed air is by slide dampers in the pipes above the operator's head.



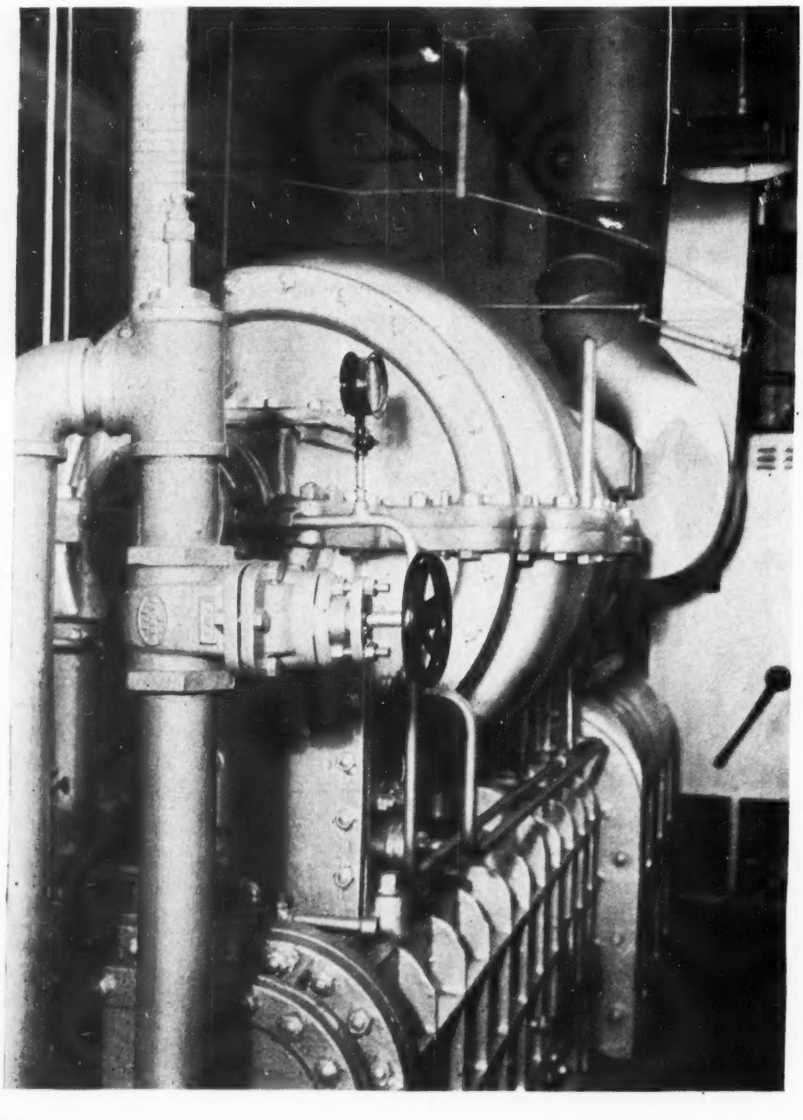
similar dusting material is used after each wetting to dry the confections before another application is made. This procedure builds up a firm undercoating which adheres well to the center and furnishes a suitable base on which to build the sugar coating. A generous volume of hot air (heated approximately to 100 deg. F.) is used during this operation to dry the coating thoroughly.

The confections are then transferred to a clean pan and are further built up with a 30 deg. Bé. sugar syrup containing a filler such as starch or flour. The coating is continued with this material until the pieces are quite white in color and the edges fairly well filled in. A substantial volume of air heated approximately to 100 deg. F. is used in this operation and as many as 10 minutes should be allowed between wettings for drying. It is essential that the confections be dried as thoroughly as possible after each operation. Technique developed through experience will determine when the best condition has been reached.

At this stage the confections are transferred to another clean pan and the coating operation is continued with the simple sugar syrup (30 deg. Bé.) until the pieces are completely smooth with the edges and rough surfaces filled in to give a smooth surface. During this stage a discretionary volume of air heated to 80 deg. F. is used. If too much heat is applied at this stage, the drying becomes too rapid and checking or chipping is likely to result.

It is at this stage in the operation that the color is applied. If the finished product is to be white, the building up to the required size with simple syrup is continued. This precaution, however, must be observed: If an attractive white confection is to be produced, it is essential that more heat be used and that the product be well dried between wettings; otherwise a grayish white product will result. In the production of various colored confections, any desired color or combination of colors may be used, but all colors used in this work must be certified food colors. To get satisfactory results, the desired color is dissolved in a suitable solvent—usually water—and the required quantity of this solution is added to a simple syrup solution such as previously used. This colored syrup is then applied in the same manner as the simple syrup, using the same volume of warm air and building up almost to the desired size. As previously mentioned, the air used during the simple-syrup and colored-syrup applications should not be too hot—approximately 80 deg. F.—and the time between wettings should be sufficiently long (approximately 10 minutes) to allow them to dry completely before the next coating.

Centrifugal ammonia compressors are an essential feature of the air-conditioning system which is so important in pan-coating operations.



Conditioning Highly Important

Between wettings, the confections are continually rolling and rubbing against each other and the sides of the pan during the time between wettings. This rubbing aids materially in grinding off high spots and smoothing out rough surfaces. On the last few wettings with syrup, cold air instead of hot air should be used, and on the last two or three wettings no air should be used at all and the confections should not be allowed to dry completely. Instead they are allowed to remain in the coating pan without rotating or are transferred to other containers and stirred sufficiently often for a short period to prevent sticking. They are now ready for polishing.

Because the finished confections from the coating operation are dull and do not have a pleasing appearance, it is customary to polish them as a final step in the operation of coating. This polishing procedure gives the confection a high luster, an attractive appearance, and helps protect the surface of the confection against drying out and checking.

The polishing operation is carried out in a special polishing pan which may be of similar shape to the ordi-

(Turn to page 225)

Keeping the "Core" Out of Canned Egg Yolks

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DURING the spring and early summer months, shelled eggs are canned whole or as separated whites and yolks for the purpose of supplying users who want them at as near fresh shell-egg quality as possible throughout the year, at a relatively low price during the fall and winter months of low fresh-egg production, and in a convenient form for handling.

These eggs usually are packed in 30-lb. cans and kept below normal freezing temperatures to inhibit bacterial and enzymic decomposition. In the case of yolks, which consist of about half water and half fat, protein, lecithin, and small quantities of other solids, some of the water separates from the solids, collects in localized spots and freezes.

This separation and freezing causes a change in appearance from the normal, fresh yolk consistency. Instead of being uniform, with the water distributed homogeneously throughout the solids, the mass begins to consist of small lumps of separated egg solids and of ice crystals. The lumpy pieces are chiefly the egg solids which have lost part of their moisture during the chilling and are becoming much harder than they were before being chilled. As the chilling progresses to freezing and further separation takes place, a "core" forms in the middle of the mass and is recognizable as a hump in the center of the top surface.

Yolks that have this "core" often thaw slowly and seldom become satisfactorily reconditioned. The resulting bits of leatherlike lumps contain egg solids which do not again become dispersed, lower the emulsifying quality of the yolks, and are likely to cause yolk specks to show in the finished product in which they are used. Also, because the core-containing yolks are slow to thaw and the outer and surface portions are diluted by the melted ice, prolific bacterial action is likely to occur and rapid spoilage take place.

Efforts have been made to prevent the formation of this "core" by speeding up the rate of chilling and freezing by the use of sharp-freezing temperatures (-12 to -15 deg. F.), and storing at 0 to -5 deg. F.* and by adding some soluble and edible materials to the yolks before chilling.

The object of the latter method is to lower the freezing point of the water content of the yolks and thereby check its separation from the solids. By so doing, more moisture remains in the solids and the partially dehydrated lumps will regain their normal consistency upon thawing.

It may seem paradoxical to say that soluble materials which will lower the freezing temperature of water should be added to egg yolks to be "frozen." In reality no one has any desire to freeze the eggs. The intention is merely to preserve the fresh shell-egg qualities as much as possible. The actual freezing is incidental and objectionable.

To be most effective the added soluble materials must not, by their presence, impair the quality of any of the yolk constituents contained in the egg solids. If by chance the added materials inhibit bacterial growth and thereby help to preserve the yolks, they have added values. Another factor important to users

*FOOD INDUSTRIES, December, 1933; pp. 502, 503 and 508.

TABLE I—*Egg Yolks "Frozen" With Various Materials*

Sample No.	Yolks Per Cent	Material Added	Added Per Cent
1—Control	100	None	None
2—Glycerin	97	Glycerin	3
3—Sucrose	93	Sucrose[1]	7
4—Sucrose-invert sugar	93	½ sucrose[1] + ½ invert sugar[2]	7
5—Invert sugar-sucrose	93	Invert sugar[3]	7
6—Invert sugar	93	Invert sugar[2]	7

[1]75 per cent cane-sugar solids.
[2]75 per cent solids of standardized plastic invert sugar.
[3]75 per cent solids of standardized liquid invert sugar (solids ¾ invert sugar)[4]

TABLE II—*Appearance During Thawing*

Hours Out of Storage[4]	Control No. 1	Glycerin No. 2	Sucrose No. 3	Sucrose-Invert Sugar No. 4	Invert Sugar-Sucrose No. 5	Invert Sugar No. 6
1	Crystals Core	Crystals No core	Crystals No core	Crystals No core	No crystals No core	No crystals No core
3	Crystals Hard center Firm throughout	Crystals Firm center Fluid outside	Crystals Firm center Fluid outside	Crystals Firm center Fluid outside	No crystals Firm center Outside more fluid than No. 2	No crystals Firm center
5	Crystals Hard center Firm throughout	More fluid than No. 1	More fluid than No. 1	More fluid than No. 1	Most fluid	More fluid than No. 1
6½	Crystals throughout Lumpy core Firm throughout	No core	Considerable core	No core	Practically No lumps More nearly than 1-4	No core homogenous
24	No crystals Not Homogeneous	No crystals Homogeneous	No crystals Homogeneous	No crystals Homogeneous	No crystals Homogeneous	No crystals Homogeneous

Differences in quality not observable in yolk mixture were brought out in baking tests. See illustrations showing cakes.

[4]Exposed in free movement of air at room temperature of 65-70 deg. F. to allow yolks both to thaw and to recondition. Thawing in moving water gives quicker thawing but does not allow time for reconditioning.

TABLE III—*Volumes in C.C. per 100 Grams*

Sample No.	1	2	3	4	5	6
Whipped yolk mixture for cake	242	256	264	263	277	261
Cake batter	135	154	156	160	146	139
Baked cake	259	311	312	334	318	318
Score, using Official A.A.C.C. System	58.4	87.6	89.7	90.8	90.1	90.8

of canned egg yolks is whether these materials added to prevent the formation of the "core" will aid in maintaining or improving the quality of the finished product in which the eggs are used.

To provide information regarding results obtainable through adding various materials to yolks before freezing, a series of tests were made in which glycerin, sucrose, invert sugar, and sucrose-invert sugar mixtures were used. Portions of a large quantity of yolks, thoroughly stirred, were measured into quart-size Mason jars to obtain sets of six samples uniform in composition and of equal weight. This small container was used to assure fairly rapid cooling under the available conditions which were analogous to commercial practice and to provide sufficient material for subsequent baking tests. One portion was used plain, as a control. The remaining portions were used in preparing sets of Samples 2-6, referred to in Table I. All sets of each mixture were placed for two days in a refrigerator set below freezing for water and subsequently kept at 10 deg. F. in a commercial cold-storage warehouse commonly used for storing frozen eggs.

After being in storage for some time, one jar of each mixture was removed and examined. The character of the frozen pack was observed. Changes during the time allowed for thawing and reconditioning were noted and tabulated in Table II.

After the yolks were thawed and allowed to stand for reconditioning, they were used in baking tests with a commercial sponge-cake formula. These tests were repeated on sets taken from storage at different times during a period of over two years and each set produced substantially the same results as the previous tests (egg yolks frozen for a few days have the same appearance as the same ones kept in storage for longer periods, although they function differently when used). Results obtained on the yolk mixtures taken after being in storage for several months are shown in Figs. 1-6, which illustrate graphically the differences in the frozen yolks and in the cakes made with them.

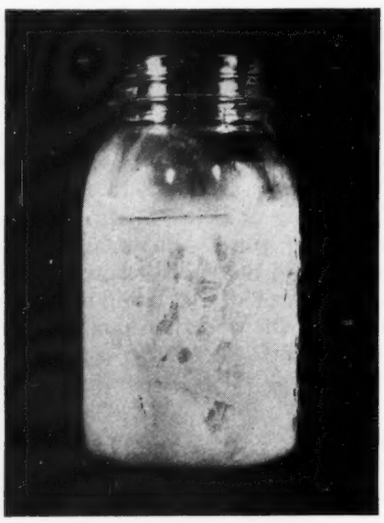
Crystal formations are seen easily through the jar containing the plain yolks (control). This is in contrast to the smoother appearance of the yolks packed with added materials. Moreover, these differences are of greater significance because they are an indication of the results that are obtained from the yolks when they are used. The quality of the cakes show as marked an improvement as the respective yolks. The relative volumes of the whipped yolks, the batter, and the baked cakes are tabulated in Table III.

All cakes except No. 1 were of good quality. Cakes from Sample No. 1 contained poor grain and numerous tunnels and had an abundance of yolk particles showing in the cut surfaces. Cakes made from Sample No. 2 contained a few yolk particles. Those from Samples Nos. 1, 2 and 3 had a less rich crust color than Nos. 4, 5 and 6. The cakes made from yolks packed with the standardized invert sugar had greater size and were of better quality.

Results tabulated in Table II substantiate those concurrently obtained

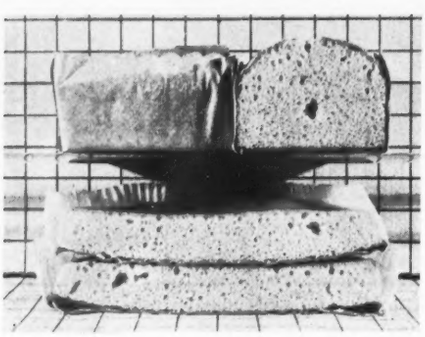
ILLUSTRATING SAMPLES OF "FROZEN" EGG YOLKS

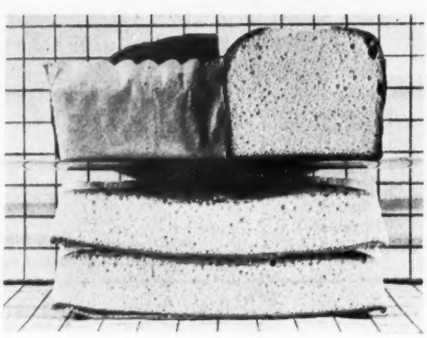
No. 1—Plain Yolks (Control).

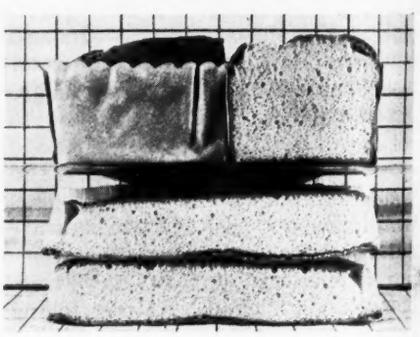


No. 2—Glycerin.

No. 3—Sucrose.







in commercial practice. The "frozen" yolk mixtures containing invert sugar were practically free from core; thawed quicker; had less separation of water and softer lumps; and regained shell-egg consistency sooner. Egg users and egg packers may be interested to know why this happens. Consciously or otherwise, they often follow the natural law which states that substances dissolved in water lower the freezing point of the water and seemingly do so, according to the same principles that determine the osmotic pressure that the substance will exert. In other words, the osmotic pressure which a substance will exert is a measure of its influence on freezing points and the extent of this influence can be calculated from molecular weights of the dissolved substances.

Invert sugar exerts a relatively high osmotic pressure and sufficiently lowers the freezing point of water contained in the yolks to prevent a portion of it from freezing out. Thus it permits more moisture to remain in the solids and prevents irreversible precipitation or coagulation of the solids and the formation of ropy lumps, such as occur in plain yolks. The moisture remaining in the solids keeps them in a softened condition so that they can readily regain their original consistency by reabsorbing the frozen moisture as it thaws. One explanation of why the yolks containing added sucrose were inferior is that the osmotic pressure of the dextrose and levulose in invert sugar is 1.75 times that of an equal weight of sucrose; dextrose and levulose each have about one-half the molecular weight of sucrose.

The increased osmotic pressure is valuable, too, in that it inhibits bacterial growth and spoilage. Syrups of high concentration are effective preservatives and are used in many food products for this reason. In this respect combinations of invert sugar and cane sugar are desirable, as they form syrups of exceptionally high density. Although considerable growth-inhibiting properties have been attributed to glycerin, tests have shown that a glycerin solution composed of 50 parts of 75 per cent invert sugar and 50 parts of glycerin develops mold, whereas 72-75 per cent invert-sugar solutions never develop mold.

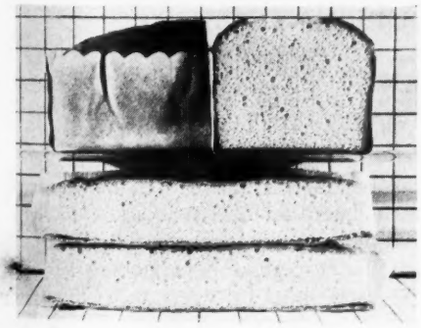
In addition to the explanations given in the preceding paragraphs for the improvement in the frozen yolks and for the convenience in quicker thawing and reconditioning, the reasons for the benefits obtained in bakery goods, ice cream and other food products are interesting. Much of the value secured from egg yolks comes from their lecithin content. As the lecithin in freshly broken and separated yolks can be readily dispersed in water, it facilitates their incorporation and uniform distribution in batches. But when packs are made with nine parts yolks and one part sucrose, the lecithin is coagulated, whereas it is not coagulated by like quantities of either levulose or dextrose. When yolks are packed with 10 per cent standardized invert sugar, containing equal parts of dextrose and levulose, they do not have their lecithin content injured and tests indicate that they give excellent results when used in bakery goods and other food products.

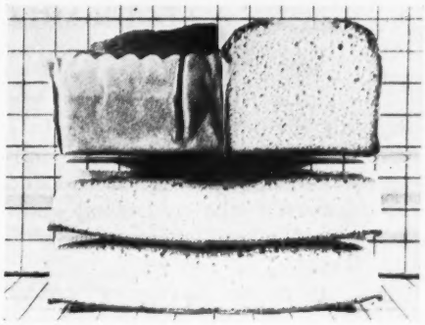
. . . . AND CAKES MADE FROM THEM [*See Table I for Contents of Jars*]

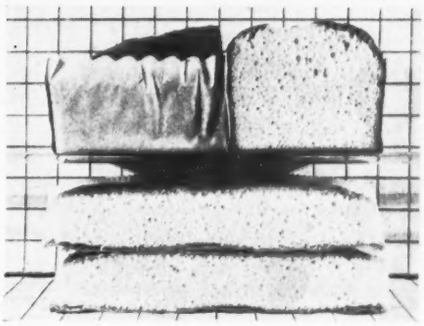
No. 4—Sucrose—Invert Sugar.

No. 5—Invert Sugar-Sucrose.

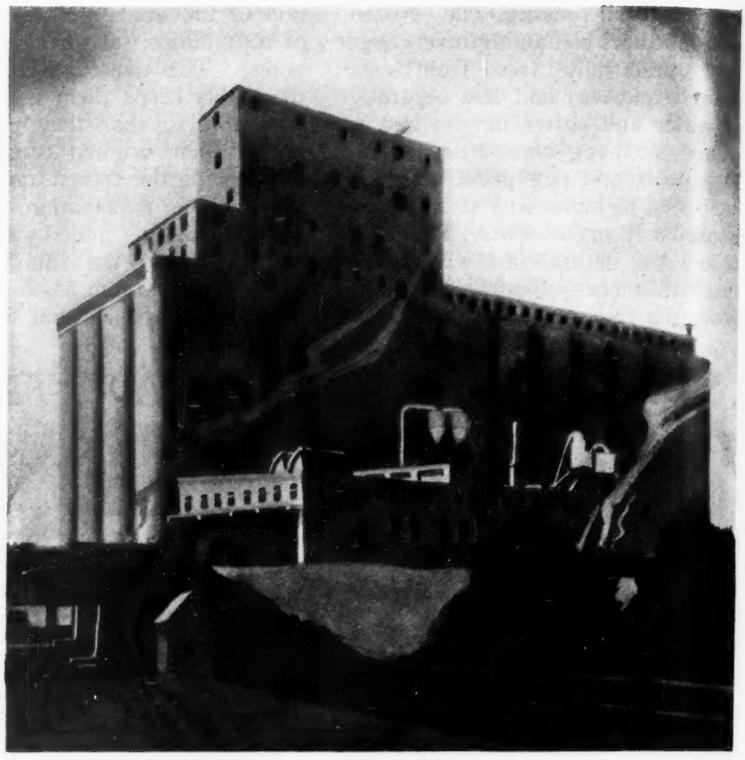
No. 6—Invert Sugar.







"Saving" 30,000 bushels of wheat, cutting lubrication expense in half, systematizing the purchase of supplies, fixing the responsibility for routine duties, and employing labor more intelligently are only a few of the benefits resulting from an impersonal analysis of a Western flour mill's operations and the blueprinting of each task. Incidentally, there was a 40 per cent saving in production costs.



It Pays to Know Your Plant Operations

· PART II ·

BY A FLOUR MILL SUPERINTENDENT

OF GREATEST interest, I believe, is our method of obtaining what we call "standard procedure." Contrary to what might be expected, it was found that the procedure to be outlined for certain operations could be most effectively obtained by working backward.

Each department was dealt with and was considered separately from all other departments. With but a general idea obtained from the departmental foreman of the operation to be covered, and its relation to the functioning of the entire department, the analyst outlined the operation unhampered by any preconceived notion of what should or should not be done by the operator.

All large-scale industries have specialization by task; milling is no exception. To one familiar with all the phases of milling it is obvious that many of the operations or elements of them would be considered not important enough to mention. However, since this work was begun to portray every step, no matter how minute, in the production of flour in our mills, the outlining was done by a man totally unacquainted with milling procedure. His task was to find the answers to the traditional questions: what, when, where, who, why, and how.

All operations having a similar character have been grouped into divisions known as "majors," which are subdivided into sections termed "minors." As an example, the apparently simple task of drawing wheat (major) has the following subdivisions (minors): determination of hole-slides to use; setting of slides into predetermined milling bins; opening valves under tanks; balancing scale; obtaining and recording grain weights.

Each "minor" is confined as closely as possible to the functioning of a single employee, and his title is written opposite the listing of the heading of the minor on the title sheet for the respective major in which it is grouped. From a series of corresponding minors, the majors are determined. Finally, at the conclusion of "procedure" of a department, all of the majors in each department are listed on one type of sheet and from them are derived the functions of the respective departments.

Each sheet is typed and submitted to the departmental foreman for his approval. If he objects to any phase of the procedure, a check is promptly made, and if work is not being performed by the employee according to original instructions, a prompt revision is made. This blueprinting of factory method and procedure is by no means an end in itself, nor is it inflexible to change or improvement. Precisely the opposite is the case. "When we find the particular procedure difficult or awkward to describe on paper," says the analyst in charge of this work, "we immediately suspect room for improvement." For example, we found that the information on the wheat sample ticket filled in by the car sampler was rewritten no less than ten times as the wheat

sample was passed around to different departments for testing purposes. Each time this information was copied in the laboratories and elsewhere, there was a potential hazard of mistake, to say nothing of the time involved in this unnecessary clerical work. As a result, we devised a sample ticket in duplicate composed of several parts. This ticket, once filled out by the car inspector, served all needed purposes as the sample passed through the plant. In such cases as this, "standard procedure" is radically different from the original methods used.

Fixing responsibility for particular tasks has been the major benefit of "standard procedure." Results from this source have been far-reaching. We found the grain department foreman unloaded grain and tanked it, but was unaware of what was taken out. The milling operators took out grain but had no knowledge of the quantity placed in tanks. As a result no one could be held responsible for grain shortage. One year, under the old plan of hit-or-miss operation, we discovered a shortage of 30,000 bu. of wheat, but were unable to fix the cause of the shortage. Under "standard procedure" we have had no shortages to contend with.

This lack of fixed responsibility we found in other departments. In the oiling of bearings and equipment, we found that foremen were unfamiliar with what each oiler was doing and how the bearings were oiled. Oilers used their own judgment and usually the slogan was "give it plenty" or "do as other oilers have done." The result was inefficient lubrication or excess oiling that meant mopping up waste oil from floors. The lubrication job was thoroughly analyzed, and when "standard procedure" was adopted we found our lubrication expense cut in half. Such savings can legitimately go into the pay of men according to the service they perform for the plant. This incident helped our men to realize that wherever they could cut cost, they made their own jobs that much more secure and the wage potentiality higher.

What was true of lubrication was true also of machinery cleaning and maintenance. No scheduled routine had been provided, and the result was that one crew depended on another to do this periodic job; too often it was neglected. Sometimes a minor adjustment of routine makes an appreciable difference. In outlining procedure for unloading grain it was found that, due to the railroads spotting cars of both sacked and bulk grain at their convenience, it was necessary to carry a large crew of

Pages from "Standard procedure," illustrating the manner in which the two "majors," one from the production department and one from the inspection department, are broken down into "minors." In effect the "minors" constitute the duties of each employee.

STANDARD PROCEDURE
INSPECTION DEPARTMENT

	Dept.	Acct.	Maj.	Min.
Code	9-4	19	12	4
Follow-Up	12		10	4-5

4. Receive Reports of Chemical Analysis

A. Receive: From Laboratory Chemists at Chief Inspector's desk with results of the particular analysis requested on any flour or cereal sample by Inspection Department. The following reports are to be received as specified:

1. Protein Slip: Duplicate of Protein Chemist's working slip, containing results of analysis for:
a. Composite samples: Of daily flour run, not later than 12 M. on day of sample delivery.
b. Special samples: Delivered at various times during day, to be received not later than 4 hours after sample delivery for samples delivered before 1:30 P.M., and by 11 A.M. of following working day for samples delivered after 1:30 P.M.

2. Moisture Slip: Containing results of moisture analysis for:
a. Composite samples: Of daily flour run, to be received not later than 12 M. of day of sample delivery.
b. Special samples: Delivered before 2:30 P.M. to be received not more than 3 hours after sample delivery, and after 2:30 P.M., not later than 10:30 A.M. of following day.

3. "Expansion Baking" Form: Containing results of volume absorption and flour color tests for:
a. Composite samples: Of daily flour run, to be received not later than 1 P.M. of day samples are delivered.
b. Special samples: On which this test is requested, to be included on first report for composite samples that time of samples delivery to Laboratory will permit.

4. "Flour Laboratory Report"—Form 46: Containing results of analyses for all samples delivered on previous day on which baking test and/or ash determination has been made, and to show protein and moisture of wheat draw samples for the wheat mix from which each flour sample has been taken. Information to be listed after the following captions:
a. Lab. No.: Series number of the sample.
b. Brand: Name of flour brand.
c. Mill: Number of the mill on which product was manufactured.
d. From
1. "Day's run," for regular composite samples.
2. Source of sample, for samples from outside.
3. "Whse" for Warehouse samples.
e. Moisture: Per cent moisture of flour sample.
f. Protein: Per cent protein of flour sample.
g. Ash: Per cent ash of flour sample.
h. Absorption: Amount in grams of yeast mix used for the dough.
i. Volume: Volume of loaf, in cubic inches for expansion loaves, and in cubic centimeters for A.C.C. pup loaves.
j. Color:
1. Dry: Color of flour.
2. Loaf: Color of loaf.
k. Dry Gluten: Nothing.
l. Wheat:
1. Dry: Per cent moisture of wheat draw sample.
2. Tempered: Per cent moisture of wheat taken ahead of the rolls.
3. Protein: Per cent protein of wheat draw sample.
m. Remarks: Any special remarks relative to the quality of the flour, and name of wheat mix to be ground on the respective mill on following day.
n. Signature of Baking Chemist.

30 SETS
Standard Procedure
Flour Milling Department

	Code	DEPT.	ACCT.	MAJ.	MIN.
	Code	10	19	22	1-15
	Follow-Up	14		6	8-9

Responsibilities

Major	22. Clean Departmental Buildings and Equipment; Maintain and Distribute Cleaning and Lavatory Supplies.
Minor Performed by	*** *** ***
Sweepers	1. Clean entrance to mill, offices, halls, stair-wells, viaducts, and Humphrey elevators.
	2. Clean Nos. 1 and 2 mills.
	3. Clean 3-4-5 mills, and northeast corner of 6th floor, feed mill.
	4. Clean No. 1 HH, 1st floor to 7th floor, inclusive, and drier.
	5. Clean No. 2 HH, 1-A floor to 7th floor, inclusive, and top of square storage.
	6. Clean No. 1 and No. 2 locker rooms and issue lockers and keys.
	7. Clean lavatories and drinking fountain.
	8. Maintain supply of, and distribute, cleaning materials in lockers and supply stations.
	9. Dispose of oil rags, garbage, and sweepings.
	10. Maintain supply of, and distribute, liquid soap, toilet paper, towels, and flour packers' and guide suits.
Head Miller **Foreman Miller** **Departmental Employee**	11. Determine and designate windows to be washed; wash windows.
Hall Sweeper	12. Pick up garbage and junk; handle sweepings.
Sweeper (for the floor)	13. Clean fire-hose reels; keep hoses in operating condition.
Head Miller **Foreman Miller** **Departmental Employee**	14. Air-clean mills and headhouses. 15. Follow-up.

men to handle sacked grain, which, or course, requires more time and men than does bulk unloading. We took the matter up with the railroads. They readily agreed to segregate the bulk cars from cars with sacked grain. This reduced our unloading cost by nearly half.

Sometimes different departments in the plant fail to cooperate or to coordinate their operations. We found that excess cost in one department was caused by an improper functioning in another. It had been taken for granted that it was not feasible to schedule the bringing of products to be packed to the shipping department at a definite time. As a result extra men were kept available to take care of the product when it arrived. In outlining this particular procedure, we discovered that nothing was to prevent proper scheduling of product to the packing department. This coordination of operation released men for other work, except for the known peak-load hours of the packing department.

Tasks May Be Simplified

At other times it was the faulty arrangement of work and equipment that slowed up processes and increased costs. "Standard procedure" revealed these sore spots. We had assumed that packs of ten bales of ten sacks each per hour per man was standard output. On one particular packing job four men produced this standard output. Time studies revealed faulty arrangement of equipment and resultant waste motion. Furthermore, the work was so unevenly distributed that one man was doing more than the others. As a result of the job analysis a corner was cut off the table or platform under the packing tube on which sacks rested while being filled. That enabled the scale to be brought close to the packing tube. The sewing-machine head was then moved adjacent to the scale and the storage platform at the end of the conveyor belt was enlarged to make the work more convenient for the baler, whose job it is to pack ten sacks into a burlap bale and sew by machine. These changes enabled three employees to pack 52 bales (520 sacks) per hour, as compared to the former output of 40 bales (400 sacks) per hour.

These are just a few instances to show what "standard procedure" has accomplished in our plant. When new methods are devised, either at the suggestion of our rank and file employees or by our research department, our procedure is changed to meet the changing conditions. When obvious improvements in method and routine have been made, and "standard procedure" is completed for a particular department, it is issued by a "follow-up" man. A copy is placed in each department as well as copies of supplements when issued. Provision is made for the easy location of even the smallest detail of an operation, which is no small advantage in view of the apparently independent operations which every department has. This is done by means of code identification stamped at the top of each sheet with four headings: "Dept.," "Acct.," "Maj." and "Min." Under "Dept." is typed the number of the department; under "Acct." is the cost accounting number; under "Maj." is the number of the major covering a series of operations; and under "Min." is the number of the minor covering the operation itself. The department number is identical with the number in the standard cost code, as are other classification numbers, with that of the major corresponding to the class of work listed on the code for standard costs and that of the minor corresponding to the job number.

Places Responsibility

The advantage of listing the different designations of the employees for each task on the major title sheet permits prompt and definite placing of responsibility for any unfulfilled task. In addition to placing responsibility, "standard procedure" provides a method of coordinating all the departments and their respective functions into one extensive process.

After all, the basic cost of production is the big factor of successful operation. Not only do the reports of the "follow-up" man reveal adherence to "standard procedure," or failure to adhere, but they give actual cost figures of current operations. These figures, compared to standard costs established, tell me exactly the degree of efficiency in the plant. It is the day-to-day cost figures that are important. End-of-the-year tabulations are just so much water gone over the dam. I am more interested in establishing standards of cost that enable me to judge the justification for expenditures before they are made. We are vitally interested in discovering duplications, lagging operations, unbalanced routine that increase the cost beyond reason.

In addition to other advantages, this compiled record of "standard procedure" assures that no employee carries his job in his head, so that a substitute, in case of illness, or a new employee need not stumble along in the dark until he learns the ropes by the trial-and-error method. Also there can be no misunderstanding as to what a particular job is and who is supposed to do it. In return the individual employee has a better conception of the whys and wherefores of his job and its relation to the rest of the plant.

With routine duties and functions carefully detailed on paper, the operator, the foreman, the superintendent, and other executives can make an intelligent study of an operation or a series of operations with a view to improving procedure or method. When certain improvements are recommended and adopted, they become a matter of record, and are not pigeonholed for future reference. Also it helps to assure a workman that he will get the credit if one of his suggestions or innovations is adopted as good practice. Change of routine is not dependent on the verbal instructions, which may or may not be adequately presented or understood. As a matter of fact, to state an operation in cold type is to invite an analysis that almost invariably results in improvement.

Permits Equalization of Labor

With virtually a plan and specification for each department and each operation at my fingers' tips, I am able to analyze variations in employee capacity, govern compensation accordingly, or bring about equalization of labor that makes for greater efficiency. Such procedure stimulates a better employee morale because all are placed on an equitable basis and favoritism is much less likely. It also aids to prevent any one employee being loaded down with more work than he can do well. If he is unable to follow his given routine, the matter is checked. Overloading any employee is to invite slipshod work.

Under such a plan no routine can be slighted during stress periods, hence undue equipment breakage and wear and tear are minimized.

Having established standards of routine, of time and of cost, they are used as a check on the adopted procedure. This is done in each department. However, once each month an inspector is sent through the plant to

(Turn to page 242)

Why *Egg-Breaking* Is Not Yet Automatic

One job in food processing where the machine has not yet displaced man

APPROXIMATELY 2 per cent of expertly candled eggs contain imperfections which are likely to pass undetected unless the eggs are broken under the scrutiny of the trained human eye. Also, there is the problem of separating the egg meats from the shells, which thus far has defied machine builders.

For these reasons, both separation and inspection have been assigned to a department in the new Best Foods, Inc., plant at San Francisco, in which crews of two, four and six men break eggs by hand as a part of plant routine. In this department as many as 50,000 shelled eggs per day are broken for use in making mayonnaise.

The eggs, which have been candled the previous evening by the poultry dealers who supply them, arrive at the plant by motor truck in 30-doz. cases on the morning of the day they are opened. Even with this assurance of freshness, the plant takes no chances on an imperfect egg getting into the mayonnaise. The process of hand-breaking eggs, used in the plant for several years, is believed to prevent the presence of any inferior material in the egg ingredient, largely because rigid inspection is practiced at all times.

This inspection is made possible by the nature of the table on which the eggs are opened. It is fitted with two trays, or "baskets," of Monel metal, equipped across the middle with a knife edge in a vertical plane to receive the breaking blow. Adjacent to these trays is a hole in the table top through which the empty shells are dropped into the refuse can. When a tray is full (it holds not more than six eggs), it is tilted by hand, so that the contents flow into the inclined trough, shown in the foreground of the illustration. Thus, with only six eggs in the tray, the contents can be inspected continually; if imperfections show up, either they can be removed or the contents of the tray can be dumped into the refuse can.

Two Men Work at Each Table

One of the two trays and one of the two troughs is used by each of two operators, who stand on opposite sides of the table. The trough is divided into two sections. The upper part is a wide, shallow depression from which the larger shell fragments can be removed quickly and easily. The lower part is a kind of settling basin about 2 in. wide and 3 in. deep, where the smaller shell fragments, less likely to be seen, can settle to the bottom. The wooden paddle is used occasionally to empty the contents of the settling basin, from which the shell fragments which have settled out can then be removed.

Eggs Are Screened

From the breaking tables the liquid egg material goes to screens with a mesh of 20 per inch, where any remaining shell particles or fibrous matter are removed.

Fully manned breaking crews fill 10-gal. metal receiving cans at the rate of 700 lb. per hour, thus producing about 5,000 lb. of fresh egg ingredient in an 8-hour day.

Shell eggs are used in this plant because of the proximity of ranches where large quantities of fresh eggs are always available at reasonable prices. The price, which varies with the season, ranges from 17 to 30 cents or more per dozen. Only large eggs are used, because the labor cost of handling is lower than for small eggs.

"Boughten" Cakes

By B. WILLARD COOK
Toronto, Canada

"We never eat 'boughten' cakes; they contain chemicals"

They were a tough proposition for this bakery engineer . . . But he made the ladies eat "bought" cake and like it . . . And cut a little bonus cake for himself besides

YES, cake is one food specialty which is still far from foolproof. I found that out. Leastways, you never know what sort of trouble you are heading into when you want to launch a new product in the cake line. By and large, the bread bakers don't know what grief is. Standard materials, standard methods, standard machinery — result: standard loaves. Sure, the bread game might not be as simple as that, but you can at least keep the factory under technical control. You never heard of standard cakes, though.

Suppose you start with an alleged "approved" recipe for kitchen cake —plain cake. Take 144 times everything for a trial batch and go through the motions as directed. Will you get a gross of approved plain cakes? You will not. This cake-baking, let me tell you, is still pretty much of an art, with just a pinch of science here and there. But you can eliminate a lot of the guesswork, provided you don't try to modernize the whole industry overnight. Stick to one or two cakes, and you can build them to order, with every step in the process rationalized. I found that out, too.

Cake-making was beneath my dignity a few years ago. My job was with the Southern Bakery, a modern establishment which served a river town of around 200,000 with some superior bread. As bakery engineer, I figured I was doing a man's work pretty well. When they mentioned cakes to me I began thinking of a pastry chef or maybe a home economics graduate. Well, I soon learned different. The simplest cake is a mighty interesting manufacturing problem, and it's not the kind you can solve entirely in the laboratory, either. Common sense helps as much as chemical analysis. A little quiet spying on the untrained help will sometimes shoot elusive trouble, too. And you can get involved in some serious scientific research besides.

The rumors on the cake development were confirmed by Colonel Batter personally, owner of the bakery. They had figured things out this way: Long ago the trade educated housewives into buying baker's bread. Factory-produced loaves are sold in every town and hamlet at around 7 cents a pound. Now why not introduce machine-made cake to the home on the profitable basis of 50 cents the pound? Corner bakeries, with "home" cooking, were getting some of the available business, but "bought" cakes were still not prominent on family marketing lists.

The Colonel's instructions were definite. "We commence with one cake," he told me. "We want it plain, but delicious, with simple but restrained dignity. Above all, it must be uniform. Outside of that, you have a free hand to get cake No. 1 in production. Your cut to begin with will be a cent a cake." And that's where we started, the bakery to make housewives eat "bought" cake and like it, and I to bake a little bonus cake for myself.

The first wave of my free hand was in the direction of the corner bakeshop and the pastry chef. The former operator of a one-man bakeshop, name of Hans, was installed as our stylist and artisan on cake, and I let him get busy on a small batch from his best recipe. He hadn't been in the place many hours before I discovered why the Colonel's plans were so cut and dried, and why I was asked to put Hans on the payroll. Hans and the Colonel had been

having periodic talks for some months. The corner bakeshop had been doing nicely as long as Hans could sell each and every cake with his personal autograph and guarantee. While the production line included one bench, one oven and one showcase, Hans had prospered. As soon as he tried expanding the business, the customers began to drift away. The larger the batches, the more frequent the complaints. Hans therefore dropped his idea of independent promotion and had been endeavoring to have the Southern Bakery finance a chain of Hans shops around town. The company didn't bite, but it grabbed his idea and traded him a job for it.

Anyway, I was in charge. I didn't know much about Hans except that he was some success as a practical cake baker and had a lot of experience. He boasted no technical training and confessed that his cakes went haywire as soon as he tried making more than a dozen at once.

"Pills to me; boules to you. Good Morning."

I knew nothing about cakes, but I figured I qualified on fundamental principles and familiarity with bakery machinery. Together we ought to make a good cake-baking team.

It took me less than a week to realize that there is more to "engineered cakes" than mechanical stirrers and traveling ovens. You can get uniform concrete with a power mixer, but you can't turn out good cakes by the same slapbang methods. I tried to translate the baking-trade jargon into something measurable about rich and lean mixtures and tough and tender textures. Sales managers for patented ingredients were prompt with advice. We were told that Elastex shortening would put a two-way stretch into the dough; that Sunrise baking powder was sure fire, or that Triplex flour was just what we needed. I got tired of those people.

The limit was a Mr. Marcell, who was sure our cakes lacked eye appeal, the same to be injected with color powder or created with silver pills planted on the icing. "Boules," he called them, available in sizes 000 to 4.

"Mr. Marcell," said I, "we aren't interested in pills. All we are after is a regular run on plain, tasty cake." Undismayed, Mr. Marcell proceeded to draw me pictures showing the difference in shape between boules and lentilles and batonnets and other sorts of tinsel for frosting. Boules, of course, were what we would need for plain cake. Losing patience, I said: "Mr. Marcell, when we start decorating our cakes, we will use silver pills. Pills to me, and boules to you. Good morning."

The next move was to compare a few recipes. The leavening ingredient was the one that set me thinking. I noticed that the formulas from the Elastex people specified Elastex shortening, but any kind of baking powder; those from the Sunrise company called for Sunrise baking powder and any kind of shortening. Maybe the reason grandmother's cakes were generally successful was because she used a leavening agent of known action, instead of any baking powder, a surprise package of uncertain strength and action time. That caused some reading about baking powders, and I was able to distinguish fast acters with tartrate, slow acters with alum, and double acters with both. We analyzed every ingredient the same way, and finally wrote a formula which meant something.

Even Hans, a pastry cook for a lifetime, admitted there were things about the business he didn't know. He talked a lot about having his cakes "set" properly. His only explanation of the "setting" process was that a rich cake requires a hot oven, which didn't enlighten me. Library research revealed that high temperature at the start of the bake bursts the starch grains, which absorb the fat.

Thus a rich cake requires a higher initial temperature for fast absorption of the large quantity of shortening. That's why a rich cake comes out of a cold oven tough and dry. I went over all that with Hans and he seemed impressed.

"Cakes Easy to Make?" Huh!!

In about a month we thought we were making a cake well enough to send samples around to picked housekeeper consumers for appraisal. We gave them the cakes and asked them for candid opinions on their palatability. The returns were scarcely flattering. That the cakes were too dry and tough was the commonest complaint. "We were beating something out that the housewife tried to put in." One lady of fixed opinions would not even look at our "trash." "I never eat 'boughten' cakes," said she. "They contain chemicals." Doubtless baking powder and cream of tartar were not on her list of "chemicals."

First we hearkened to the critic who thought we were whipping the personality out of our cakes, or something. In our angel cake, the mixing problem sifted down to the chief constituent, egg white. The easy mistake is to whip the albumen dry, thereby making the cakes tough. Trying to standardize the mixing, we chilled the egg white and we warmed it. Some batches we merely flicked and others we threshed soundly. The results were nearest uniform when we started with albumen at shop temperature and ran the mixer at medium, constant speed, for about five minutes. Then we started fold-

ing in flour. We used a 20-qt. mixer and did the whipping at 1,000 r.p.m. The requirements might differ for some other machine. Hans was the one who decided on the "about five minutes." He whipped for good volume, but started the flour while the foam was still moist.

Next we had to bake to the satisfaction of our sample housewives. They didn't want the cakes raw and they didn't want them dry and crusty. In other words, they had to be neither underbaked nor overbaked. Hans knew what the public wanted, but his cakes came out tougher than little angels ought to be. The mixing and baking, however, seemed to Hans to be exactly right. That meant I had to watch a batch go all the way through the plant. Well, there were no departures from routine up to the point where Hans started snatching cakes from the traveling oven to cut and try. "Done," said he, and walked away. I stuck around. It was plain that the cakes were getting an extra "do" of radiated heat after they emerged from the oven. I made Hans check on it. It amounted to an extra ounce of water a cake—a serious overbaking.

Cake No. 1 Is Finally Ready

Southern Bakery's cake No. 1 (angel) went out first with the bread drivers, and the reception was thoroughly disappointing. More people than we thought for refused to eat "boughten" cake, no matter how good. So Colonel Batter and the sales manager and the quite useful Hans and I went into conference. Why wasn't an angel cake offered by Southern as salable as an inferior cake in the Hans bakery shop? The answer was prejudice, but a prejudice we would exploit rather than destroy.

The tactics were simple. The corner shop which Hans used to run came "under new management." We fixed it up as Bunny's Cake Store, specializing on home-made angel cake. We didn't swear it was home-made on the premises. The flour barrels and kitchen ware were left in plain sight as scenery. Sure enough, the ladies with the marketing lists were soon calling at Bunny's just as they had been calling on Hans, on their way to the butcher's and the grocery store. The next move, of course, was substations about town for Bunny's main store. We didn't even pretend to bake on the premises by that time, because cake No. 1 had taken hold, and nobody asked what factory it came from or whether it contained chemicals.

We taught ourselves a couple of other tricks after we got into regular production. One had a factory angle, another pit that Hans fell into. Periodically, Bunny's passed on complaints of tough texture, which didn't encourage repeaters. I had to check and double check on several batches before I got to the bottom of that mystery. Hans missed it because it was his first experience with quantity production. I missed it because I did my laboratory experimenting with shell eggs, broken one at a time.

Ladies with marketing lists were soon calling at Bunny's.

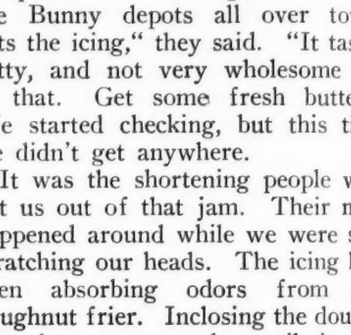
In the plant we used canned egg white. Canned albumen separates into watery and gelatinous parts, with the latter sticking to the can. Hans said that the gummy white whipped up to normal volume. I told him to use all gelatinous albumen in one batch, and the cakes came out tough. That meant a new item in the instructions. Canned egg white had to be stirred like paint for uniform results.

The other find was made when we were satisfied with our quality but weren't too happy about production costs. It was a straight piece of chemical research. I had the laboratory try a number of stunts to increase the volume whipped from our expensive egg whites. Funny thing, but we found the volume the smallest, other conditions the same, with the albumen at normal pH. When we varied the hydrogen-ion concentration a trifle, up or down, before whipping, we got a substantial increase in volume, and hence more cakes per egg, with an appropriate saving. However, again we found ourselves flirting with trouble. Unless the finished batter was slightly acid, the cake crumb was not as white as our customers wanted.

Southern's cake No. 2 was a fried job—in other words, a doughnut. It was scheduled to appear in two models only, sugared and plain. Doughnuts were simpler than angel cake and the routine was much easier to standardize. By the time we had the automatic frying machine installed we were ready to submit the Colonel a range to pick from, any of which we knew we could make. From the assortment of color and crust and richness and flavoring he chose what he thought would catch the local market, and announced what the doughnut bonus would be. It wasn't a cent a unit this time, but it made us feel we were still part of the business.

The optimism didn't last long, however. Just as we were counting our first profits on No. 2 we had complaint calls on angel cake from the Bunny depots all over town. "Its the icing," they said. "It tastes fatty, and not very wholesome fat at that. Get some fresh butter." We started checking, but this time we didn't get anywhere.

It was the shortening people who got us out of that jam. Their man happened around while we were still scratching our heads. The icing had been absorbing odors from the doughnut frier. Inclosing the doughnut department and ventilating it were the only sure remedies. We should have tumbled to it ourselves, but I guess our olfactory nerves were



Hans was a good cake baker but had no technical training.

fatigued with frying smells. We stopped production on No. 2 while the carpenters got busy, and—presto! —No. 1 regained its appetite-appeal immediately.

I think we did our share toward raising "bought" cake in public esteem. We handled only two products, but we got them on a controlled basis. Maybe cake-baking is a luxury trade, but we found money in it anyway.

Are Housewives Intelligent Buyers of Foods?

By JULIA NICHOL AMBURGEY
and
JESSIE V. COLES
Department of Home Economics, University of Missouri, Columbia, Mo.

HOW intelligent are modern housewives as buyers of food? Do they recognize their difficulties in buying? Do they use the guides available in buying intelligently? These are questions which a recent study of food buying habits carried on in the department of home economics of the University of Missouri has attempted to answer.

In spite of the fact that they either buy or direct the buying of a very large percentage of the foods purchased by their families, we must come to the conclusion, if Missouri housewives are representative of all housewives, that they are unobserving or uninterested or just plain ignorant about food buying problems.

The unfamiliarity of Missouri housewives with brands was pointed out in a previous article.* They also show a lack of knowledge of the information given on the labels of foods. Methods which they use in designating quantity and qualities of foods desired indicate a similar lack of information. Apparently few are accustomed or able to describe specifically the foods they buy.

It might be assumed that they would be interested in reading what is on the labels of foods, since two-thirds of the housewives said they preferred to buy food, other than fresh food, in packages. But apparently they are not.

Three-fourths of them said they read the labels on packaged foods. In order to find out what they knew about the information found on labels, they were asked to state what they looked for on the labels of a list of selected foods each of which usually carries some specific information on the label in addition to brand and weight. Sixteen per cent of those who said they read the labels could not name a single point to look for on the labels of any of the foods! Less than 45 per cent indicated more than one point for which to look.

Brands were looked for more frequently than any other type of information, from 5 to 25 per cent looking for the brand on the labels of the different foods. Next to brands, form or composition was most frequently looked for. However, with the exception of three foods, less than one-tenth of the housewives examined labels for such information.

The number who looked for name of producer ranged from none to 3 per cent. The replies also indicated that little attention is given to weight of contents. Some home makers said they looked for information which, in so far as can be determined by close observation, is never given on the labels of the foods listed.

The *number* of units desired usually was given by less than one-half of the housewives when they made out detailed market orders. They used type of container—as bottle, sack, package—to designate quantity more frequently than any other method. Standard terms for indicating size of containers were used by only a few, even when such terms are generally available. They apparently are much more accustomed to use such terms as "large," "small," "square," and the like. Weight and measure were used by less than one-half of the housewives in cases where this method of indicating quantity is the only one available.

Little or no attempt was made by the majority of housewives to describe the qualities of foods. Some depended on brands, while a few others used variety, form, size and price to indicate quality. Non-standard terms were used much more commonly than the standards terms, even when standard terms were available.

Apparently many houswives do not recognize their difficulties in buying foods. One-third of the Missouri housewives studied either said they had no difficulties in buying or did not answer the question. Thirteen per cent said they had difficulties, but could not tell what they were when asked to name them. Some indicated that they would have no difficulties if they had more money to spend.

Fresh fruits and vegetables and meats were considered most difficult to buy. "Staple" foods and canned foods were considered least difficult. Approximately 30 per cent said that they found canned foods least difficult to buy. This is interesting, since those who have studied food-buying problems carefully consider canned goods difficult to buy intelligently.

Evidently experience in keeping house does not make housewives more intelligent in buying foods. In this study, little or no correlation between their experience and information was found. The housewives who had kept house for long periods of time seldom showed a better knowledge of how to buy than did the younger home makers who had had less experience as buying agents.

On the whole, the urban housewives studied showed more intelligence regarding buying than did those of the rural group. A larger portion of them answered the questions as asked. They were more alert to available methods of indicating quantities and qualities of foods. This slightly superior information of urban housewives may be due to the fact that they do somewhat more of the buying than do the rural housewives and more frequently go to the market. They also produce fewer of their foods at home. Perhaps retailers in cities are more careful to give information to buyers than those in the rural areas.

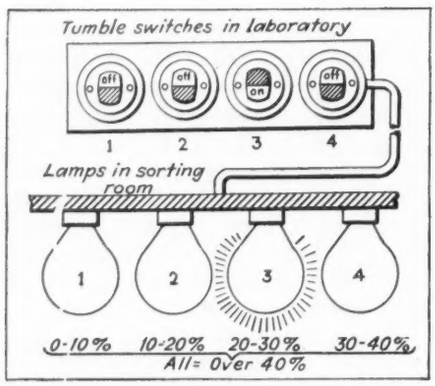
*Food Industries, April, 1934; pp. 170-171.

Better Inspection Control

The Lights Flash the Mold Count and the Tomato Sorters Change Their Pace

By ARTHUR E. SCHILLER
Chief Chemist, E. Pritchard, Inc.
Bridgeton, N. J.

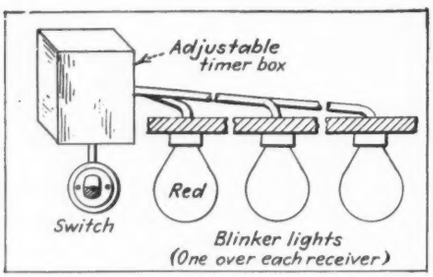
Inspection which is unnecessarily close will increase costs through slowing down production. It is important for all hands to know and understand what they are doing in order to achieve the most economical results. But even more important is it to flash them an instantaneous warning when they are not keeping up to company standard.—Editor.



● **A BANK OF FOUR LAMPS** located in the sorting room and controlled by switches in the laboratory enables the control chemist to signal mold counts to the sorters.

◆

● **FEEDING OF TOMATOES** to the sorting belts is regulated according to the mold count. The forelady sets the adjustable timer and switch to signal that more or fewer tomatoes are wanted. A blinker lamp is over each tomato dump.



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THERE is nothing remote about the laboratory control of the Bridgeton (N. J.) plant of E. Pritchard, Inc. By a flip of the switch the control chemist communicates the results of his mold count to inspectors on the tomato-sorting belts. By another—a time switch—the speed of feeding the tomatoes onto the belts is regulated. If the mold count is too high, fewer tomatoes go through and the sorters examine them more thoroughly. If the count is lower than it need be, operations are speeded up and unnecessary retardation of production goes out of the window.

Effective as it is, this control system comprises nothing more complicated than a few signal lights with their circuits and switches. A bank of four colored lamps, so located in the sorting room that they may readily be seen by all the women along the sorting belts, notifies these inspectors whether the mold count is low or high and by how much. A blinker lamp over each tomato dump communicates the control chemist's message that the rate of feeding must be changed and indicates whether it ought to be faster or slower.

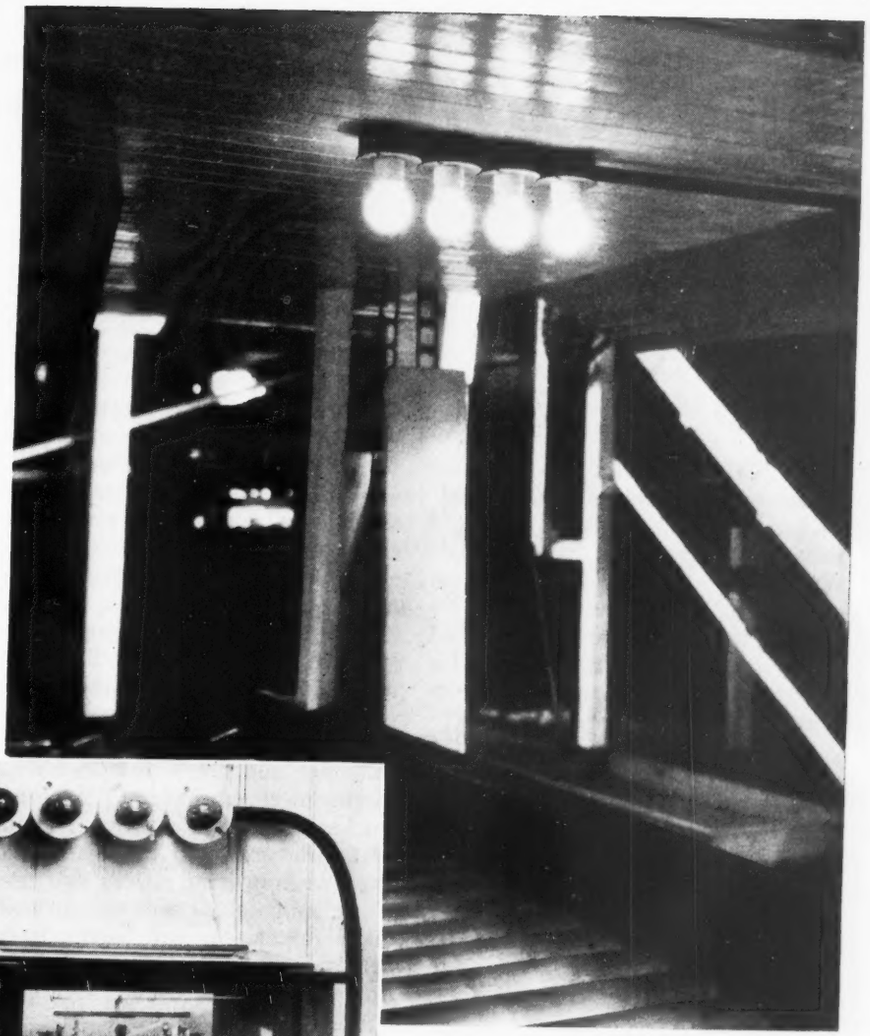
On the four lamps for signaling mold count, one indicates a count of 0 to 10 per cent; the next, a count of 10 to 20 per cent; No. 3, 20 to 30 per cent; and the fourth, 30 to 40 per cent. When all are lighted, it means the count is over 40 per cent, which is much too high. Four tumble switches installed in the laboratory near the microscope control these lamps. And as soon as the control chemist has made a mold count on a batch of tomato pulp or purée, he reaches over and snaps the switch corresponding to that particular count.

The blinker lights controlling rate of feeding are operated through an adjustable timer box and switch which is located near by so as to be convenient for the individual in charge of the inspection force. If the mold count is too high, the timer is adjusted to blink the lights slowly and the workers dump fewer tomatoes onto the sorting belts. If the count is low, the timer is set for fast blinking and operations speed up.

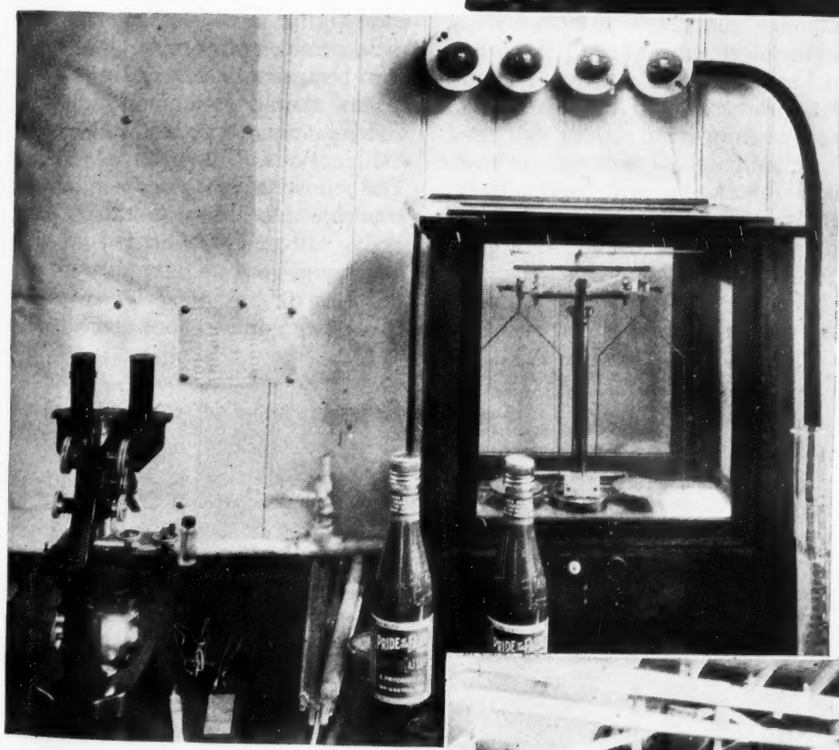
This coordination of rate of feeding with closeness of inspection gives accurate mold-count control.

Realizing that efficient sorting is the keynote of quality in the finished product, the Pritchard plant has always given much attention to the tomato-sorting belts, making improvements in their control from year to year. Nearly every feasible plan has been tried, and in the 1933 season the signal plan was put into effect. The results have been excellent. Not only is the control chemist able to maintain almost any desired mold count but the sorting is more efficient when not retarded by unnecessarily close inspection.

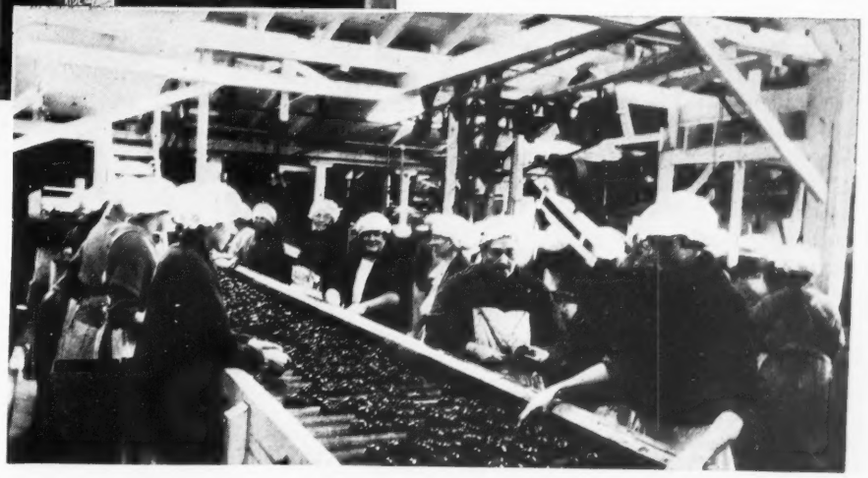
by Signal Lights



● **TUMBLE SWITCHES** near the control chemist's microscope enable him to signal the sorting room as soon as he has made the mold count.



● **LIGHTS OVER THE SORTING** tables now keep all hands informed on the thoroughness of the sorting. If all lights flash on, the mold count is over 40 per cent and that means everyone is to get busy and do a closer job of inspecting and sorting.



● **TOMATO SORTING** as performed before the days of signal-light control. Shouts from the foreman largely regulated the activities of the sorters.

Putting *Spice Seasoning* on a

By LLOYD A. HALL
Consulting Chemist
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IN THE industrial procedure of seasoning meats and meat products, spice-oil emulsions or liquid seasonings have several definite advantages over ground spices. These advantages have been recognized by meat packers and sausage makers and have resulted in the replacement of a large quantity of the ground spices by spice-oil emulsions.

A spice-oil emulsion, as it is being offered to the meat industry at the present time, is not, as some have believed, a bottled chemical. It is a liquid product—an emulsion—made from the concentrated essences of dry spices or the essential oil of spices, and a small quantity of it contains many times the flavoring value of an equal weight or volume of the whole spices.

It is being used for flavoring pickle brines, catsup, bakery products, mayonnaise and other food products which require spice or essential-oil flavors as well as for seasoning meats.

When spice oils are used in place of the whole spice, a saving can be effected with very little change in the spice flavor. One great advantage in the use of spice-oil emulsions is that there are no color effects introduced. This factor is particularly noteworthy in the case of sausage products. The objectionable black spots common to some sausage, and said to be introduced into these products by the tannin contained in the ground spices, are eliminated. The essential oil of the spices contains no tannin. Also a uniformity of flavor and quality is assured, as sufficient oils for the entire season's production can be carefully blended at one time.

For seasoning meats, spice-oil emulsions are used in a simple manner: The required quantity, which has been determined as ranging from 4 to 5 oz. per 100 lb. of meat, is measured out, poured on the mass of meat, and rapidly and thoroughly mixed in.

For sausage making the emulsion can be supplied for practically any type by matching the ground-spice formula which has been used.

From Table I one can readily see that a small quantity of essential oil or oleoresin will replace the whole spice. This fact becomes more significant as there appears to be no difficulty in matching various ground-spice formulas. A great many formulas have been duplicated with essential oils made into emulsions and in practical use appear to give a smoother and better balanced flavor to the meat product. Cooking and smoking tests indicate that no more of the flavor is lost by volatilization than when ground spices are used. The elimination of such non-aromatic matter as starch, dirt, leaves, husks, bark and tannin makes a decided improvement in the color and appearance of the product.

Spice-oil emulsions for seasoning meats was first offered to the meat industry only a little more than six years ago. Since then many improvements have been made as a result of research work done on these products. Emulsions were found to be more suitable and more efficient for flavoring purposes than essential oils because of their thorough and uniform incorporation. Also they were found to retain their flavoring value to a greater degree than do the essential oils of the spices during the cooking or smoking process. However, it was not a simple matter to make a spice-oil emulsion with the desired properties.

In the manufacture of spice-oil emulsions for meat products, such emulsifying agents as gelatin, egg yolk, pectin, gum arabic, gum acacia, gum tragacanth, locust-bean gum, casein, starch, Irish moss, agar-agar and albumins, together with various combinations of them, have been used. The most satisfactory and stable emulsion has been produced, however, with a combination of gum acacia and gum tragacanth in the proportions of 1 oz. and 1½ oz. respectively per gallon of emulsion.

Abstracted from a paper presented at American Chemical Society convention in Chicago, Ill., Sept. 10-15, 1933.

Uniform Strength and *Quality* Basis

Experiments have shown that the best emulsions have a pH range of 4.20 to 4.60 and that these emulsions over a period of four months have very little separation (Tables IV and V).

To enhance the keeping qualities and stability of the emulsions, treated water is used. The hydrant water is first filtered through an alum-and-gravel filter and then is treated in an ozone water purifier which supplies 6 mg. of ozone per liter of water. The treatment gives practically a sterile water. No chemical preservatives are used in the manufacture of these emulsions; if careful sanitary conditions are observed in the manufacturing operation, none is needed.

Emulsions, whether prepared in the laboratory or in commercial practice, usually contain dispersed globules of very different diameters. The process of subsequently reducing these globules to an approximately equal diameter many times smaller than the average previously attained in the emulsion is termed homogenization, and the resulting product is called a homogenized emulsion.[9] In recent years the advent of colloid mills opened up new possibilities in preparing finely dispersed and stable technical emulsions.

Alsberg[10] has a process of emulsification by which he produces a stable, homogeneous flavoring emulsion consisting of a solution of an excipient as gum arabic and glycerin in water. His emulsion is completely filled with minutely subdivided globules of a characteristic material and a negative filler by homogenizing at a pressure of 3,500 to 4,000 lb. per square inch.

Spice-oil emulsions are being manufactured satisfactorily with the use of both homogenizers and colloid mills. In fact, it is necessary in the production of commercially satisfactory spice-oil emulsions that the finishing process be either homogenizing or colloidizing.

In this connection it is interesting

(Turn to page 225)

TABLE II

Summary of the Advantages of Spice-Oil Emulsions for Seasoning Meats[3]

1 — Greater uniformity of quality and flavoring value.
2 — No color added, or, substances which would cause color disturbances, other than the natural color of the spice oils and oleoresins.
3 — Less bulk in storage.
4 — Less weight in shipping.
5 — No danger of mold formation.
6 — No loss in flavoring value by exposure in package while being stored.
7 — No starch is introduced into the product.
8 — Ease of handling.
9 — Cost, compared to equivalent spice value, is less.
10 — Entire flavor is available immediately.

TABLE III

Typical Formulas for Meat Seasoning.

Standard Formula for Frankfurters

Oil of pimento	40 cc.
Oil of nutmeg	120 cc.
Oil of coriander	10 cc.
Oil of marjoram	5 cc.
Oil of cinnamon	2 cc.
Oleoresin ginger	5 cc.
Oleoresin capsicum	45 cc.
Gum tragacanth	1½ oz.
Gum acacia	1 oz.
Water	to make 1 gallon
Weak acid or alkali solution	to give proper pH.

Standard Formula for Pork Sausage

Oil of celery	⅛ oz.
Oil of nutmeg	3 oz.
Oil of ginger	¼ oz.
Oil of sage	1½ oz.
Oil of marjoram	½ oz.
Oleoresin capsicum	3 oz.
Gum tragacanth	1½ oz.
Gum acacia	1 oz.
Water	to make 1 gallon
Weak acid or alkali solution	to give proper pH.

TABLE IV

pH Values for Some of These Emulsions.

Sample Emulsion	pH Value*
Pork No. 1	4.58
Pork (with sage)	4.44
Pork (without sage)	4.27
Frankfurter No. 1	4.35
Frankfurter No. 2	4.32
Frankfurter No. 3	4.49
Frankfurter No. 4	4.57

*pH Values were determined on a Welch Hydrogen-Ion Apparatus using a Quinhydrone electrode.

TABLE V

pH Values of Some Unstable Spice-Oil Emulsions.

Sample	pH	Separation in
No. 1	4.83	4 days
No. 2	5.75	2 days
No. 3	5.03	4 days
No. 4	5.25	3 days

TABLE I

A Comparison Between the Strength of Whole Spice and the Essential Oil of the Same Spice[1, 2]

Pounds	Spice	Equivalent to Pounds Oil
100	Clove buds	15
100	Pimento berries	2½
100	Cassia bark	1
100	Cardamom seed	3
100	Celery seed	2
100	Cinnamon, Ceylon	½
100	Coriander seed	¾
100	Dill	2½
100	Estragon herb (tarragon)	⅛
100	Laurel leaves	1
100	Marjoram	½
100	Nutmeg	5
100	Paraley grain	2
100	Thyme, white French	2
100	Mace	2
100	Star anise	1½
100	Fennel	2½
100	Ginger	¼
100	Pepper	1
100	Curcuma (turmeric)	4
100	Capsicum	5 Oleoresin
100	Ginger	5 Oleoresin

TABLE VI

pH Values of Water Used, and of Gum Solutions.

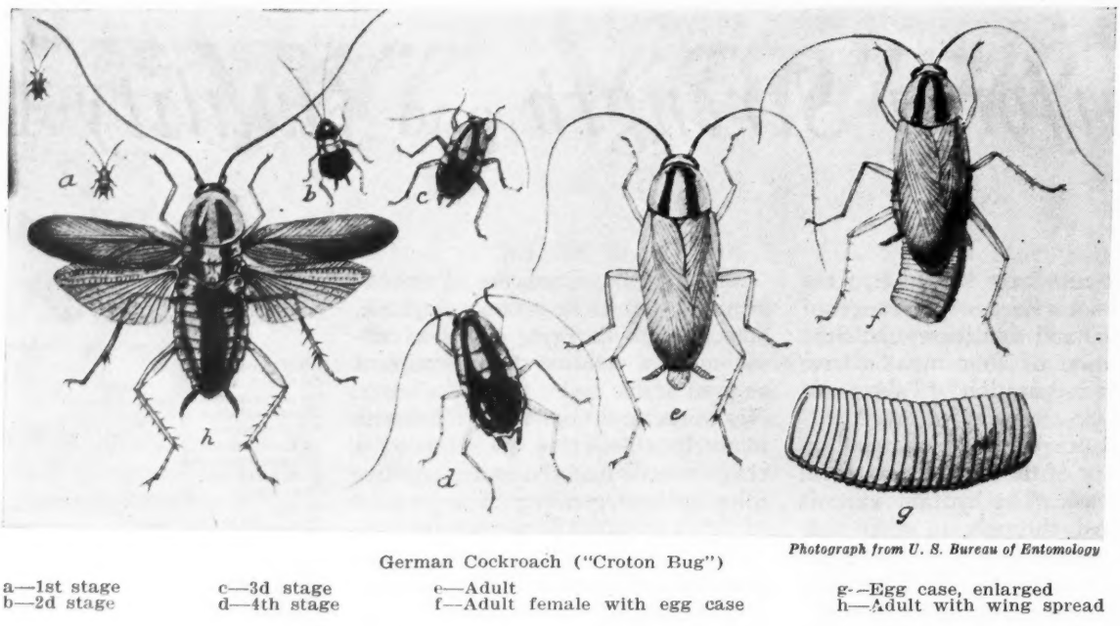
Chicago city hydrant water of Nov. 22, 1928	7.20
Distilled water	6.38
Filtered and ozonized water	6.10
2% Solution gum tragacanth	6.00
2% Solution gum karaya	6.52
2% Solution gum acacia	5.50

TABLE VII

Results of Bacteriological Investigations Conducted During the Development of These Emulsions.

Specimen	Bacterial Count
Frankfurter emulsion No. 1335-C	5,000 per cc.
Frankfurter emulsion No. 1338-O	200 per cc.
Minced ham, A	200 per cc.
Pork Sausage, B	200 per cc.
Bologna, C	1,000 per cc.
Chicago city hydrant water	200 per cc.
Filtered and ozonized water	10 per cc.
Ground coriander spice	75,000 per gram.
Ground decoricated pepper	75,000 per gram.(a)
Ground nutmeg	50,000 per gram.
Rubbed Dalmatian sage	5,000 per gram.(b)

Emulsions tested two weeks after their manufacture.
(a) Numerous spore formers.
(b) Numerous molds.



German Cockroach ("Croton Bug")

Photograph from U. S. Bureau of Entomology

a—1st stage
b—2d stage
c—3d stage
d—4th stage
e—Adult
f—Adult female with egg case
g—Egg case, enlarged
h—Adult with wing spread

Controlling Cockroaches

Not Difficult In Any Plant

By **HARRY STINER**
Albany, N. Y.

ONLY four out of the several hundred identified species of cockroaches are commonly encountered in the food plant. These are, by ordinary names, the: American, Australian, German and Oriental. Structural points common with all four of them are: their heads are always bent beneath the central section of their bodies, thus giving the appearance from above of an insect without eyes. They all possess two long, slender antennas (feelers), six slender legs trimmed with sharp spines, and bodies that are uniformly oval and very flat—or thin. Most of them are rapid in their movements and become very restless when disturbed. They bite and chew their food, are quite liberal in their choice, and customarily remain hidden except at night or in a subdued light.

The American cockroach (clock or water bug) is about one and one-half inches long when full grown, has a reddish brown color, is very active, and can fly. Its growing period from egg to adult is about one and one-half years, after which it may live for an equal length of time. As a rule it favors the lower, darker, and more moist parts of the plant, such as: sewer traps, boiler rooms and pipe tunnels. However, because the adults may wander for comparatively great distances and the females frequently carry their egg capsules with them until about ready to hatch, small nests of from ten to twenty-five young ones are likely to be encountered in most any damp part of the building.

The Australian cockroach is very similar to the American in color and general habits. The adults average a little smaller than the American and their habitats are more distinctly of a tropical nature. This roach will frequently be encountered in the Southern States and may be the predominating species in certain localities, but it has not as yet ventured far north.

> They are easy to kill, have definite habits and habitats, and breed in localized places

The German cockroach (Croton bug) is about one-half to five-eighths inch long when full grown, is of a yellowish brown color with two black spots on top at its fore end. It is very active; although able to fly, it seldom does. Nests of this species may be encountered in or near any moist spot in the plant, but as a rule these cockroaches choose sections that are somewhat warmer than does the American variety, and can seemingly thrive in much drier localities when other things are favorable. The females always carry their capsules of about twenty-one eggs with them until nearly ready to hatch—usually within six to twelve hours. Because of this, also perhaps because of its small size, the German roach usually is considered the most difficult one of all to control. Its growing period is about six months, after which it may live as an adult for six to twelve months longer.

Oriental roaches (black beetles) are about one inch long when full-grown, are shiny dark brown or black in color, and are comparatively slow in action. The adult females are wingless, and the wings of the male

are very short. Neither can fly. They usually choose much drier nesting places than the American or German varieties, and, as a rule, are less cosmopolitan, preferring to keep to themselves in the less frequented parts of the building. They will often be encountered in storerooms, in warehouses, or, on warm nights, around the building outside. They are not as universally distributed as the other varieties and seldom as plentiful, although in some localities they may be the major pest.

Taking food plants as a group, cockroaches may be considered the most universal pest of all. They nest when possible in dark, damp places and multiply rapidly. Their nests are always musty, foul-smelling spots and usually are inaccessible to ordinary cleaning methods. Being nocturnal in habits, they generally remain under cover during the day, but emerge in full force at night. They move rapidly and the adults will travel considerable distances; running at random over any and all food materials, tables, and machinery they encounter. Their bodies are always covered with bacteria, molds, and putrid material from their nests which they freely distribute over and through whatever they touch. The quantity of food they actually consume is of little importance compared to what they ruin with their filth and odor, as their food in large part consists of small particles which have fallen to the floor or have lodged in corners and cracks of uncleaned tables, machinery, and other equipment.

● When sanitary practices are observed in a food plant, microorganisms do not have an opportunity to multiply; rodents and similar plant pests do not have ready access to food materials; foreign, obnoxious odors are absent; and in structural details the plant is a praiseworthy source of the foods we eat.

● Yet sanitation is not all that is required to keep a plant free from destructive pests. There are insect pests upon whose activities sanitation is little or no curb. They find their way into the best appointed plants and, unless combated by systematic housekeeping, will remain, multiply and inflict much damage.

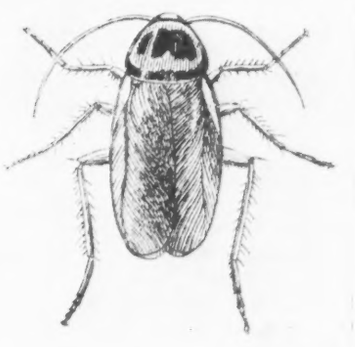
● Without some knowledge of their appearance, their habits, and preferences, and of the most appropriate or customary methods of dealing with them, the operator will often be at a disadvantage in his work, and indefinable losses may obtain.

● In this and following articles each type or group of pests that are commonly encountered in food plants will be discussed. Also what is generally considered the most effective or popular method for their control will be given. Aside from the bacterial group and rodents, which will be dealt with separately, they will be listed in their relative importance so far as is possible.

While cockroaches may be considered unsanitary in every sense of the word, general cleanliness will not always result in a satisfactory control unless accompanied by some effort to attack them in their nests. Their food requirements are so meager and their taste so universal it is almost impossible to starve them out by keeping the plant well cleaned and sanitary.

In hunting for cockroach nests—which should always be done at night—the age or size of the specimens encountered is a very good index. Newly born roaches of any species will always be found within a few inches of their home. As they grow their ranging field expands until all identity of their source is lost. The adults may frequently be encountered in comparatively clean, dry places where there is no evident inducement whatever. Although the adult females do often carry their egg capsules around and may occasionally drop them in some dry place, the young are certain of extinction if no water can be reached.

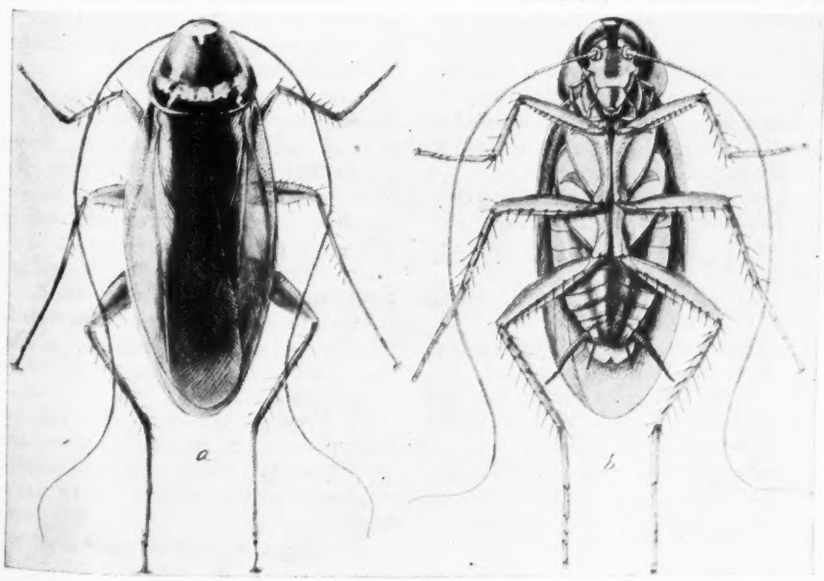
As to favorite locations for nesting, only moisture can serve as a guide. Each plant will contain certain spots more attractive than others and the only answer is hunt for them. Where two or more varieties infest the same plant—which is often the case—the smaller types usually will choose the upper sections, while the larger ones will favor the basement. However, this is not always the case, as two varieties may occasionally be found in the same location and with their nests only a few inches apart.



Australian Cockroach (natural size)

American cockroach ("water bug"); a—from above; b—from below.

Photograph from U. S. Bureau of Entomology



Control measures for all domestic cockroaches are essentially the same. The most effective and by far the cheapest method, when possible, is to close all openings that lead to their nests. This procedure is not always entirely practicable, however, and such places as cannot be filled must be cared for by other means. Regular

(Turn to page 242)

Definitions and Standards

*FOR FOOD PRODUCTS**

The following definitions and standards for food products have been adopted as a guide for the officials of this department in enforcing the food and drugs act. These definitions and standards include those published in S. R. A., F. D. 2, revision 3, and those adopted May 12, 1933.

HENRY A. WALLACE, *Secretary of Agriculture,*
WASHINGTON, D. C., Aug. 1, 1933

THESE DEFINITIONS are so framed as to exclude substances not mentioned in the definition and in each instance imply that the product is clean and sound.

II. VEGETABLE PRODUCTS

D. Condiments (Except Wines and Vinegars)

b. FLAVORING EXTRACTS

1. A flavoring extract[a] is a solution in ethyl alcohol of proper strength of the sapid and odorous principles derived from an aromatic plant, or parts of the plant, with or without its coloring matter, and conforms in name to the plant used in its preparation.

2. Almond extract is the flavoring extract prepared from oil of bitter almonds, free from hydrocyanic acid, and contains not less than 1 per cent by volume of oil of bitter almonds.

2*a*. Oil of bitter almonds, commercial, is the volatile oil obtained from the seed of the bitter almond (*Amygdalus communis* L.), the apricot (*Prunus armeniaca* L.), or the peach (*Amygdalus persica* L.).

3. Anise extract is the flavoring extract prepared from oil of anise, and contains not less than 3 per cent by volume of oil of anise.

3*a*. Oil of anise is the volatile oil obtained from the anise seed.

4. Celery-seed extract is the flavoring extract prepared from celery seed or the oil of celery seed, or both, and contains not less than 0.3 per cent by volume of oil of celery seed.

4*a*. Oil of celery seed is the volatile oil obtained from celery seed.

5. Cinnamon extract, cassia extract, cassia cinnamon extract, is the flavoring product prepared from oil of cinnamon, and contains not less than 2 per cent by volume of oil of cinnamon.

5*a*. Oil of cinnamon, oil of cassia, oil of cassia cinnamon, is the lead-free volatile oil obtained from the leaves or bark of *Cinnamomum cassia* (L.) Blume, and contains not less than 80 per cent by volume of cinnamic aldehyde.

6. Ceylon cinnamon extract is the flavoring extract prepared from all of Ceylon cinnamon, and contains not less than 2 per cent by volume of oil of Ceylon cinnamon.

6*a*. Oil of Ceylon cinnamon is the lead-free volatile oil obtained from the bark of the Ceylon cinnamon (*Cinnamomum zeylanicum* Nees), and contains not less than 65 per cent by weight of cinnamic aldehyde and not more than 10 per cent by weight of eugenol.

7. Clove extract is the flavoring extract prepared from oil of cloves, and contains not less than 2 per cent by volume of oil of cloves.

7*a*. Oil of cloves is the lead-free volatile oil obtained from cloves.

8. Ginger extract is the flavoring extract prepared from ginger, and contains in each 100 cubic centimeters the alcohol-soluble matters from not less than 20 grams of ginger.

9. Lemon extract is the flavoring extract prepared from oil of lemon, or from lemon peel, or both, and contains not less than 5 per cent by volume of oil of lemon.

9*a*. Oil of lemon is the volatile oil expressed, without the aid of heat, from the fresh peel of the lemon (*Citrus limonia* Osbeck), with or without previous separation of the pulp and peel.

10. Terpeneless extract of lemon is the flavoring extract prepared by shaking oil of lemon with dilute alcohol, or by dissolving terpeneless oil of lemon in dilute alcohol, and contains not less than 0.2 per cent by weight of citral derived from oil of lemon.

10*a*. Terpeneless oil of lemon is oil of lemon from which all or nearly all of the terpenes have been removed.

11. Nutmeg extract is the flavoring extract prepared from oil of nutmeg, and contains not less than 2 per cent by volume of oil of nutmeg.

11*a*. Oil of nutmeg is the volatile oil obtained from nutmegs.

12. Orange extract is the flavoring extract prepared from oil of orange, or from orange peel, or both, and contains not less than 5 per cent by volume of oil of orange.

12*a*. Oil of orange is the volatile oil obtained, by expression or alcoholic solution, from the fresh peel of the orange (*Citrus aurantium* L.), and has an optical rotation (25 deg. C.) of not less than +95 deg. in a 100-millimeter tube.

13. Terpeneless extract of orange is the flavoring extract prepared by shaking oil of orange with dilute alcohol, or by dissolving terpeneless oil of orange in dilute alcohol, and corresponds in flavoring strength to orange extract.

13*a*. Terpeneless oil of orange is oil of orange from which all or nearly all of the terpenes have been removed.

14. Peppermint extract is the flavoring extract prepared from oil of peppermint, or from peppermint, or both, and contains not less than 3 per cent by volume of oil of peppermint.

14*a*. Peppermint is the leaves and flowering tops of *Mentha piperita* L.

14*b*. Oil of peppermint is the volatile oil obtained from peppermint, and contains not less than 50 per cent by weight of menthol.

15. Rose extract is the flavoring extract prepared from attar of roses, with or without red rose petals, and contains not less than 0.4 per cent by volume of attar of roses.

15*a*. Attar of roses is the volatile oil obtained from the petals of *Rosa dama-*

*Revision 4, Service and Regulatory Announcements, Food and Drug, No. 2, issued August, 1933, by Food and Drug Administration, U. S. Department of Agriculture.

[a]The flavoring extracts herein described are intended solely for food purposes and are not to be confounded with similar preparations described in the Pharmacopœia for medicinal purposes.

scena Mill., *R. centifolia* L., or *R. moschata* Herrm.

16. Savory extract is the flavoring extract prepared from oil of savory, or from savory, or both, and contains not less than 0.35 per cent by volume of oil of savory.

16*a*. Oil of savory is the volatile oil obtained from savory.

17. Spearmint extract is the flavoring extract prepared from oil of spearmint, or from spearmint, or both, and contains not less than 3 per cent by volume of oil of spearmint.

17*a*. Spearmint is the leaves and flowering tops of *Mentha spicata* L.

17*b*. Oil of spearmint is the volatile oil obtained from spearmint.

18. Star anise extract is the flavoring extract prepared from oil of star anise, and contains not less than 3 per cent by volume of oil of star anise.

18*a*. Oil of star anise is the volatile oil distilled from the fruit of the star anise (*Illicium verum* Hook.).

19. Sweet basil extract is the flavoring extract prepared from oil of sweet basil, or from sweet basil, or both, and contains not less than 0.1 per cent by volume of oil of sweet basil.

19*a*. Sweet basil, basil, is the leaves and tops of *Ocimum basilicum* L.

20. Sweet marjoram extract, marjoram extract, is the flavoring extract prepared from the oil of marjoram, or from marjoram, or both, and contains not less than 1 per cent by volume of oil of marjoram.

20*a*. Oil of marjoram is the volatile oil obtained from marjoram.

21. Thyme extract is the flavoring extract prepared from oil of thyme, or from thyme, or both, and contains not less than 0.2 per cent by volume of oil of thyme.

21*a*. Oil of thyme is the volatile oil obtained from thyme.

22. Tonka extract is the flavoring extract prepared from tonka bean, with or without one or more of the following: Sugar, dextrose, glycerin. It contains not less than 0.1 per cent by weight of coumarin extracted from the tonka bean, together with a corresponding proportion of the other soluble matters thereof.

22*a*. Tonka bean is the seed of *Coumarouna odorata* Aublet (*Dipteryx odorata* (Aubl.) Willd.).

23. Vanilla extract is the flavoring extract prepared from vanilla bean, with or without one or more of the following: Sugar, dextrose, glycerin. It contains in 100 cubic centimeters the soluble matters from not less than 10 grams of the vanilla bean.

23*a*. Vanilla bean is the dried, cured fruit of *Vanilla fragrans* (Salisb.) Ames (*V. planifolia* Andr.).

24. Wintergreen extract is the flavoring extract prepared from oil of wintergreen, and contains not less than 3 per cent by volume of oil of wintergreen.

24*a*. Oil of wintergreen is the volatile oil distilled from the leaves of *Gaultheria procumbens* L.

c. MAYONNAISE DRESSING

Mayonnaise, mayonnaise dressing, mayonnaise salad dressing, is the semi-solid emulsion of edible vegetable oil, egg yolk, or whole egg, a vinegar, and/or lemon juice, with one or more of the following: Salt, other seasoning commonly used in its preparation, sugar and/or dextrose. The finished product contains not less than 50 per cent of edible vegetable oil.

E. Edible Vegetable Oils and Fats

1. Edible fats and edible oils are such glycerids of the fatty acids as are recognized to be wholesome foods. They are dry, and sweet in flavor and odor.

● Beginning with the January, 1934, issue, FOOD INDUSTRIES has been publishing each month the federal definitions and standards covering the principal foods. "Meat and Principal Meat Products," "Milk and Milk Products," "Grain Products," "Fruits and Vegetables," "Sugars and Related Substances" and "Spices" have been covered. The remaining sections will be published as rapidly as available space will permit.

● Study them and see if they can be improved and that they cover the foods you manufacture. Make your recommendations to the Food Standards Committee of the Department of Agriculture. Also, be prepared to attend the public hearings that will follow the enactment of a new law and to take a hand in formulating definitions and standards for the foods you do or may want to manufacture.

● Copies of these definitions and standards can be obtained from the Department of Agriculture. Address your request to W. S. Frisbie, Chairman, Food Standards Committee, Food and Drug Administration, U. S. Department of Agriculture, Washington, D. C.—Editor.

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2. Cacao butter, cocoa butter, is the edible fat obtained from sound cacao beans (seeds of *Theobroma cacao* L. or other closely related species), either before or after roasting.

3. Coconut oil, copra oil, is the edible oil obtained from the kernels of the coconut (*Cocos nucifera* L. or *C. butyracea* L.).

4. Cochin oil is coconut oil prepared in Cochin (Malabar).

5. Ceylon oil is coconut oil prepared in Ceylon.

6. Corn oil, maize oil, is the edible oil obtained from the germ of Indian corn, maize (*Zea mays* L.).

7. Cottonseed oil is the edible oil obtained from the seed of the cotton plant (*Gossypium herbaceum* L.), or from the seed of other species of Gossypium.

8. Olive oil, sweet oil, is the edible oil obtained from the sound, mature fruit of the olive tree (*Olea europaea* L.).

9. Palm kernel oil is the edible oil obtained from the kernels of the fruit of the palm tree (*Elaeis guineensis* Jacq., or *E. melanococca* Gaert.).

10. Peanut oil, arachis oil, earthnut oil, is edible oil obtained from the peanut (*Arachis hypogaea* L.).

11. Poppy-seed oil is the edible oil obtained from the seeds of the poppy (*Papaver somniferum* L.).

12. Rapeseed oil, rape oil, colza oil, is the edible oil obtained from the seed of the rape plant (*Brassica napus* L.), or from the seed of closely related Brassica species which yield oils similar in composition and character to the oil obtained from the seed of *B. napus* L.

13. Soybean oil, soy oil, soja oil, is the edible oil obtained from the seed of the soybean plant (*Soja max.* (L.) Piper; *Glycine soja* Sieb. and Zucc.; *Soja hispida* Moench).

14. Sesame oil, gingilli oil, teel oil, benne oil, is the edible oil obtained from the seed of the sesame plant (*Sesamum orientale* L.; *S. indicum* L.; *S. radiatum* Schum. and Thonn.).

15. Sunflower oil is the edible oil obtained from the seed of the sunflower (*Helianthus annuus* L.).

F. Tea, Coffee, and Cacao Products

a. TEA

1. Tea is the tender leaves, leaf buds, and tender internodes of different varieties of *Thea sinensis* L., prepared and cured by recognized methods of manufacture. It conforms in variety and place of production to the name it bears; contains not less than 4 per cent nor more than 7 per cent of ash; and meets the provisions of the act of Congress approved March 2, 1897, as amended, regulating the importation and inspection of tea.

b. COFFEE

2. Coffee is the seed of cultivated varieties of *Coffea arabica, C. liberica,* and *C. robusta.*

a. Green coffee, raw coffee, unroasted coffee, is coffee freed from all but a small portion of its spermoderm, and conforms in variety and in place of production to the name it bears.

b. Roasted coffee, "coffee," is properly cleaned green coffee which by the action of heat (roasting) has become brown and has developed its characteristic aroma.

BATTERIES *for Motor*

Ample Size and Proper Care Are Requisites for Low-Cost Car and Truck Installations

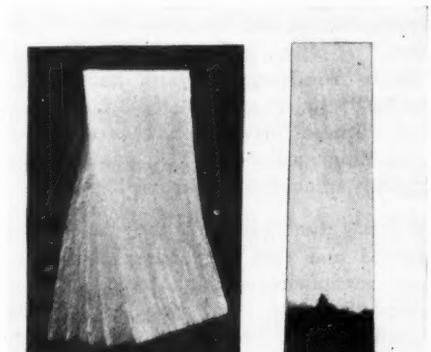
AMPLE size and proper care are prime requisites for low-cost passenger-car and motor-truck storage-battery installations. Any fleet operator in the food field who expects to get the most for his battery dollar must be certain of these factors. They apply with equal emphasis to large storage batteries used to propel electric trucks and to smaller batteries for starting, lighting and ignition purposes on gasoline passenger cars and trucks.

Ample Size Easily Checked

Ample size is easy to obtain provided the purchaser does not attempt to cut corners too close in order to reduce initial expense. Given the known conditions under which the battery is to work, the fleet operator may calculate the capacity required and have his selection double-checked by both the vehicle and the battery manufacturer. There is no economy in the selection of an undersized battery, even with a low first cost. The amount saved is more than offset by a reduced life and a consequent higher unit battery cost in addition to inconvenience and interruptions in service.

Battery care is a "horse of a different color." It depends almost wholly upon the vehicle owner or his service force. That capacity which the manufacturer builds into his battery cannot be taken out of it in service by the user unless the latter gives the battery that care which the manufacturer intended that it should have.

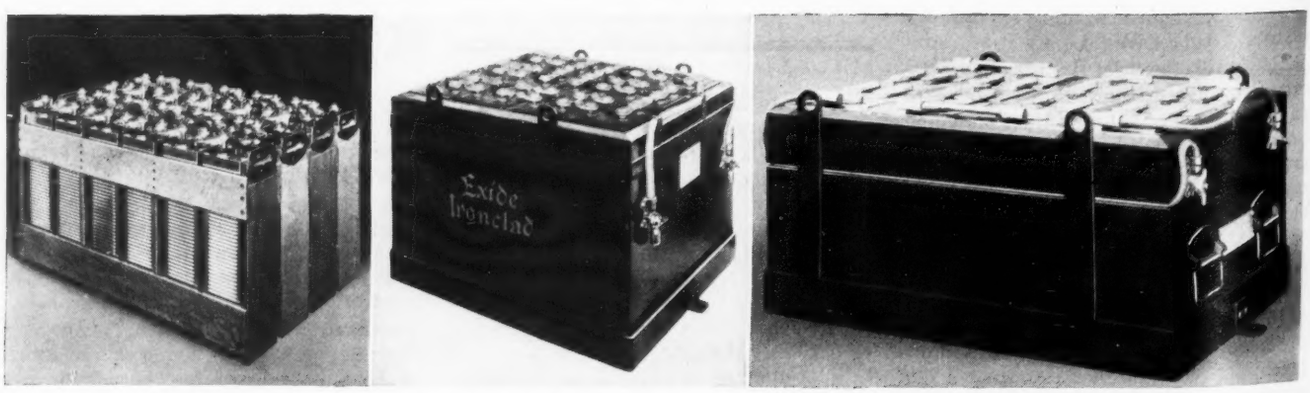
But what is this important care and why is is necessary? As space does not permit of a full exposition of all the technical details of battery construction, charging and servicing, an understanding of the fundamentals of the storage battery is essential to rendering that care which is necessary for long life and low cost per vehicle mile. To the intelligent motor-fleet operator the battery must be much more than a little black box or combination of cells out of which an electric current may be obtained in some mysterious manner.



In the Gould Kathanode propulsion battery, the retainer is made of finely spun glass threads formed into a mat of many layers, as shown above. The porosity of the mat to permit a full supply of electrolyte to the surface of the positive plate is indicated by the saucer test of the mat's capillary action.

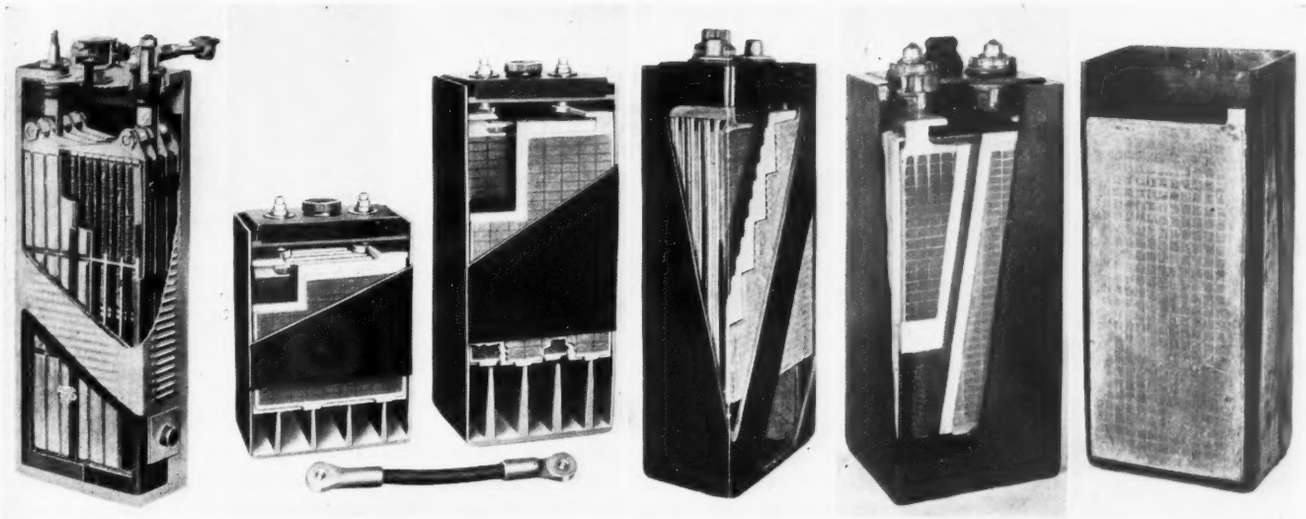
The Two Cell Types

The unit of the storage battery is the cell with the battery itself, consisting of a varying number of cells of varying sizes connected together to provide varying current capacities. The cell consists of two elements or plates, a negative and a positive, immersed in a liquid called the electrolyte, held in a suitable container. There are two types of cells. One of these is the lead-acid cell, so named because the plates of the cell are made of lead, and the electrolyte is sulphuric acid. The other cell is the Edison, named after its inventor, Thomas A. Edison. In it the positive plate contains nickel oxide and flake nickel and the negative plate contains iron oxide. The electrolyte is potassium hydroxide. When both types of cells are charged, the energy of the electric current causes certain chemical changes to take place When being discharged, these chemical changes are reversed, producing an electric current. The storage battery, therefore, does not store up electricity,



Three typical electric-truck propulsion batteries. Left—A group of Edison nickel-iron-alkaline cells. Center—A 12-cell Exide Ironclad industrial truck battery. Right—A 12-cell industrial truck battery made by U.S.L. Battery Corp., Niagara Falls, N. Y.

Vehicles in the Food Field



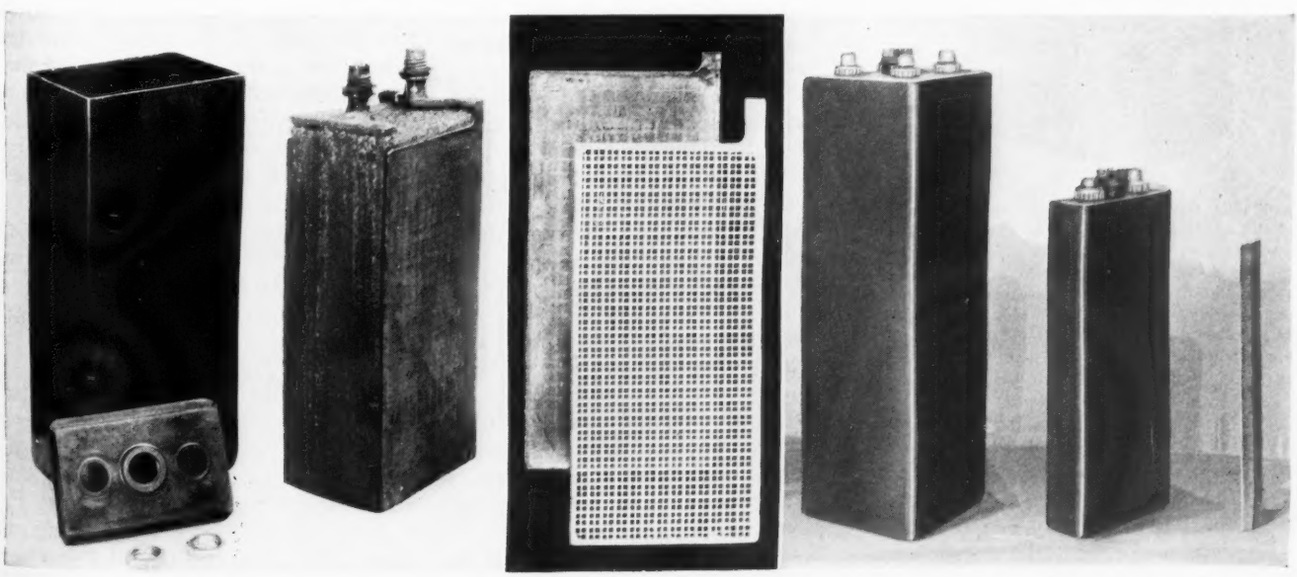
Typical cell constructions of truck propulsion batteries. From left to right are shown the Edison nickel-iron cell; two U.S.L. cells, showing the plate arrangement and method of alternate bridge support; a K.W. cell, showing the plates; wood separators; rubber envelopes and rubber jar; the Gould Kathanode cell with its spun-glass retainer mat and the Sturges cell characterized by plates which extend to the bottom of the rubber jar and acid-resistant fiber separators inserted between the plates under compression.

but chemical energy which is capable of producing electricity.

Electricity is measured by three units. Conductors offer a resistance to the passage of an electric current through them. The unit of resistance is the ohm. Current strength is the quantity of electricity that passes a given point in a circuit in one second. The unit of current strength is the ampere. The driving force that sends an electric current through a resistance is called the electromotive force. It is measured by the volt. The relationship of these three units of current measurement is expressed in Ohm's law which states that the current strength in any circuit is directly proportional to the electromotive force and inversely proportional to the total resistance of the circuit. Expressed differently, the current strength in amperes equals the electromotive force in volts divided by the resistance in ohms.

The current strength furnished by a single cell depends upon the electromotive force and the resistance. The electromotive force, or voltage, of a cell depends upon the nature of its electrodes, or plates, and is independent of their shape or size. A small cell gives the same voltage as a large one of the same kind.

The internal resistance of a cell depends upon the size of its electrodes, their distance apart, and the electrolyte. The internal resistance is inversely proportional to the area



The cell assembly of the Sturges battery is seen at the left. Note the distinctive fiber separators introduced between the plates under compression. The special construction of the Sturges grid plate is shown in the center. At the right is shown the larger Type TL Exide Ironclad cell, as compared with the Type MVA cell. The comparison rule at the right is 12 in. long.

Representative starting and lighting batteries for passenger cars and gasoline trucks. From the top down are shown the Willard, Prest-O-Lite, Firestone, Globe and the Goodrich Electro-Pak designed for passenger-car service and featured by a cover for protection against dirt, water and short-circuits caused by dropping tools across the terminals.

of the submerged portion of the electrodes; the larger the area, the smaller the resistance of the cell. The internal resistance is directly proportional to the distance between the electrodes; the further the electrodes are apart, the greater the resistance of the cell.

When single cells of same voltage are connected in series, or when the negative electrode of one cell is connected to the positive electrode of the next, the voltage of the battery is equal to the voltage of one cell multiplied by the number of cells. Similarly, the internal resistance of the battery is equal to the internal resistance of one cell mutiplied by the number of cells.

Thus, with unit cell voltages of approximately 2.17 for lead cells and 1.85 for Edison cells, a variation in the number of plates in each cell and the grouping of the required number of cells in series, batteries of ample capacity for any given work can be made up.

From the fundamental lead-acid cell consisting of two lead plates immersed in a solution of sulphuric acid, progress in battery design has developed a series of plates arranged alternately in the cell with an excess of one negative plate so that all surfaces of the positive plates may be active. All the positive plates in each cell are joined by a lead connecting strap to form a positive group and all the negative plates into a negative group.

Purpose of Separators

The plates of the two groups are kept from contacting each other by separators, usually made of wood or rubber or both. One side of the wood separator is flat and presses against the negative plate, while the other is ribbed and presses the rubber sheet against the surface of the positive plate. The separators prevent contact of the plates, which would cause a short-circuit; allow circulation of the electrolyte; and permit the escape of gas formed in the charging operation.

The lead plates are formed of a strong network or frame of lead alloy into which the active material is firmly pressed. This procedure permits of the greatest amount of active material in the least space with strength to withstand expansion and contraction and provide good conductivity to the passage of the electric current.

When the battery is fully charged the positive plate is heavily coated with lead peroxide and the negative plate is pure, spongy lead. When being discharged the positive plate yields oxygen and becomes coated with lead sulphate. The negative plate also becomes coated with lead sulphate.

When the battery is charged the process is reversed until the current has charged the plates sufficiently for the greater part of the lead sulphate

Plate assembly of the Globe starting and lighting battery, showing plates shielded by hard-rubber sheets and selected wood separators.

to be decomposed. Further passage of current results not in useful chemical action but in breaking up the water of the electrolyte into hydrogen and oxygen gas. This gassing should be kept to a minimum because it tends to force small particles of active material from the plate faces to the bottom of the cell as sediment. This reduces the life of the plates. The gassing also evaporates water from the electrolyte, so that additional water must be added.

Charging a lead battery completely without excessive gassing or heating and keeping the height of the electrolyte always $\frac{1}{2}$ in. above the tops of the plates sum up briefly the necessary care which assures long battery life.

Other Details of Care

Of course, only direct current can be used for charging purposes. The polarity must be correct. The positive terminal of the battery must be connected to the positive pole of the supply source.

In charging, the starting rate should be as specified by the battery manufacturer and this should be reduced in several steps, to avoid excessive gassing and high temperature, until the finishing rate has been reached. The charge should be continued at this rate until the voltage and specific gravity have risen to maximum values.

It is better to stop the regular charge too soon than to overcharge. The current should be reduced if excessive gassing begins or the temperature rises above 110 deg. F.

If any cell has a reading higher than 1.300 or lower than 1.250 when fully charged, it is an indication of trouble such as a leaky jar, partial short-circuit or sloppage.

Cutaway showing the plate sizes of the three models of the National Battery Co., St. Paul, Minn. At the left is the large-capacity "Heavy-weight"; in the center, the "National," with performance in excess of S.A.E. specifications; and at the right, the "Nateo," used where first cost is the major consideration.

The lead-battery manufacturers have made many improvements in the design of their batteries to make it possible for the user to get long battery life. For example, the Electric Storage Battery Co., Philadelphia, Pa., brought out its Exide Ironclad propulsion battery, in which the conventional type of flat pasted positive plate is replaced with tubes of finely slotted hard rubber. These tubes permit the electrolyte to reach the active material but prevent the latter from escaping by the same means. This has increased the battery life two or three times. Four years ago the same company brought out a Type TL cell interchangeable with the Type MVA cell, but taller, to give 43 per cent greater capacity on the same base area.

The Gould Kathanode motive-power battery illustrated in this article is featured by the use of a spun-glass retainer which is strong and flexible and yet extremely porous to the action of the electrolyte as well as resistant to its chemical action.

The K. W. Battery Co., Inc., New York, N. Y., maker of a sturdy, conventional type lead battery for electric trucks, has for the past 20 years specialized on rendering battery service to truck owners without capital outlay on the basis of a monthly rental or guaranteed monthly expense on specified mileage ranges.

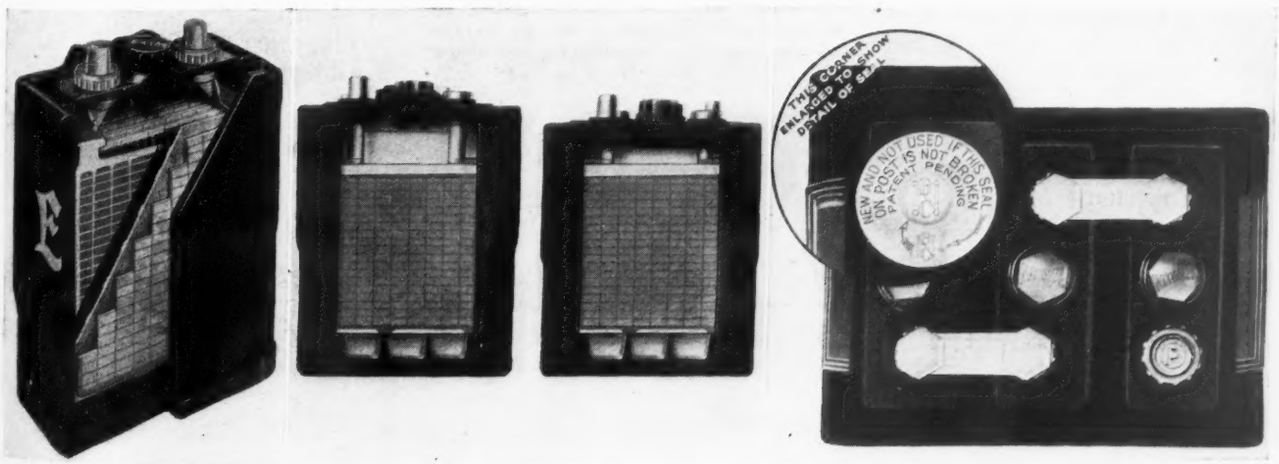
The U. S. L. Battery Corp., Niagara Falls, N. Y., has developed a new battery oxide named "Activite" to give greater battery capacity and longer life.

Sturges Design Is New

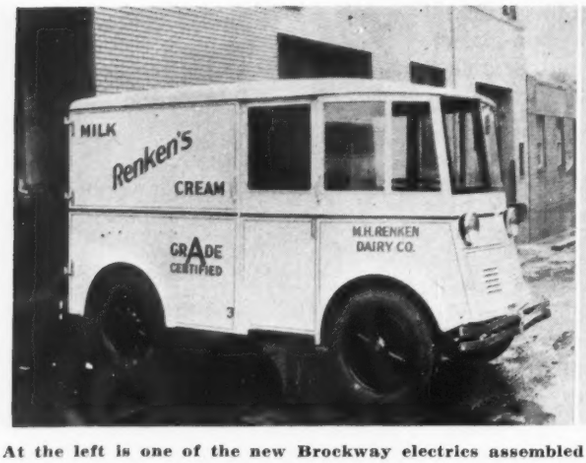
One of the most recent and revolutionary developments in lead-battery design is contained in the Sturges propulsion battery, made by the Sturges Multiple Battery Corp., New York, N. Y. In the Sturges battery, which is illustrated on page 221, the ordinary wood or rubber separator is replaced by a sheet of specially treated, highly acid-resistant fiber of high porosity which is introduced between the plates under compression. The fiber forms a complete envelope around the plates individually and as a whole. This eliminates the shedding of the active material and permits the plates to extend to the bottom of the jar in the space usually allotted to sediment collection. Thus a battery of 270 ampere-hour capacity occupies the same tray space as a unit of 170 ampere hours and practically doubles the working hours of the battery per cycle without materially increasing the weight.

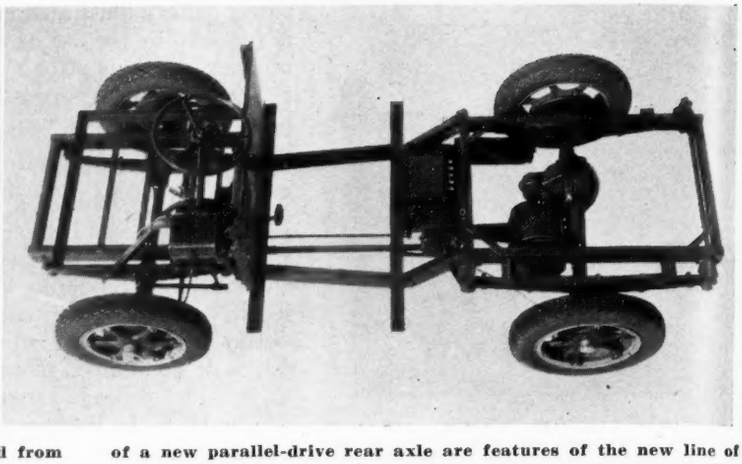
Another feature of the Sturges battery is the ability to eliminate the free electrolyte above the tops of the plates, since sufficient electrolyte is absorbed in the fiber insulation to operate the cell. It is thus impossible

Three examples of heavy-duty starting and lighting batteries for truck use. At the top is a 12-volt Exide battery assembled in a genuine hard-rubber case with adjustable handles. In the center is a Goodrich heavy-duty truck type. At the bottom is a 12-volt Prest-O-Lite truck unit.



A cutaway cell of a 6-volt Exide starting and lighting battery is shown at the left. Of the two cutaway views in the center, that at the left shows a "HiLevel" Prest-O-Lite battery as compared with an ordinary battery. The "HiLevel" battery under normal conditions needs refilling only three times a year. At the extreme right is a top view of a National battery, showing the terminal seal, which, if unbroken at the time of purchase, assures the buyer that he is getting a new and unused battery.





At the left is one of the new Brockway electrics assembled from standard parts and priced, except for the battery, at about the same as the complementary gasoline-truck chassis. Location of the entire battery at the front of the chassis and the development of a new parallel-drive rear axle are features of the new line of Walker chassis such as shown at the right. Greater use of alloy steels has reduced the chassis weight so that the truck mileage has been increased without an increase in the battery size.

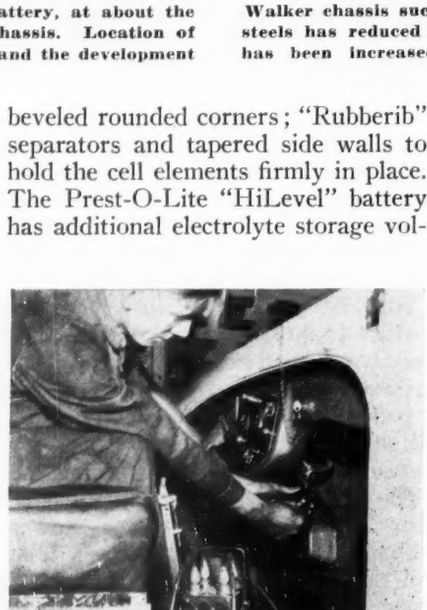
to lower the level of the electrolyte to the point of exposing any of the plate surface to injurious sulphation. The Sturges plate grids also are of special construction, as shown on page 221. Sturges batteries may be had on either a sale or rental basis.

Choice of Lead Batteries

Other lead batteries for starting and lighting purposes, as made by the Firestone Tire & Rubber Co., Akron, Ohio; B. F. Goodrich Co., Akron, Ohio; Globe-Union Manufacturing Co., Milwaukee, Wis.; National Battery Co., St. Paul, Minn.; Prest-O-Lite Storage Battery Corp., Indianapolis, Ind., and the Willard Storage Battery Co., Cleveland, Ohio, are illustrated on pages 222 and 223.

Features of the Willard line designed to give increased battery life include thread-rubber insulators with six hard rubber ribs; rugged plate grids and the highest grade, chemically pure oxides.

Long-life features of the Prest-O-Lite line include improved plate oxides and processes; grids with beveled rounded corners; "Rubberib" separators and tapered side walls to hold the cell elements firmly in place. The Prest-O-Lite "HiLevel" battery has additional electrolyte storage volume above the tops of the plates so that it requires watering only three or four times a year.

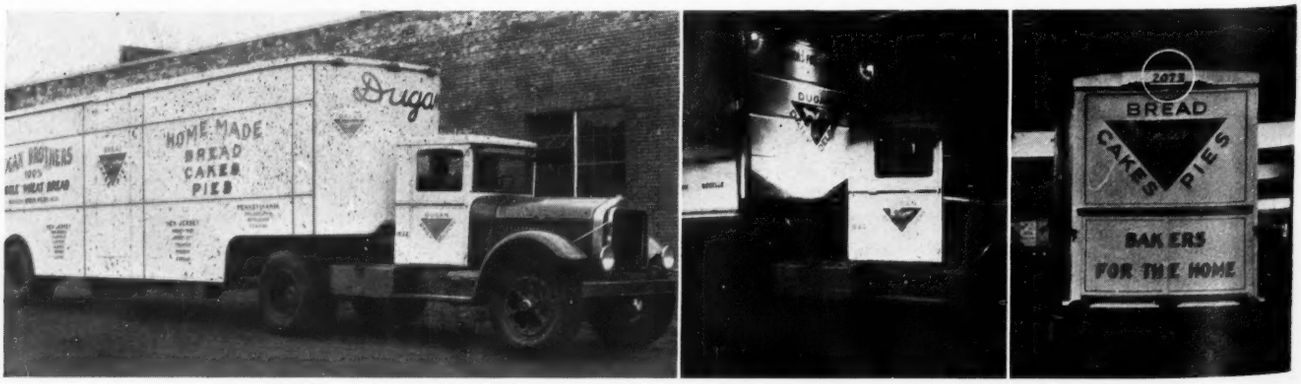


The Tritox automatic battery charger, by means of which the battery may be charged without removing it from the passenger car or motor-truck chassis.

The Edison nickel-iron motive-power battery illustrated herewith has characteristics quite different from the lead battery. It is lighter in weight for a given capacity; is higher in price but has a much longer life. Both active materials return to their original state after each cycle of charge and discharge. No equalizing charge is ever necessary. It is not subject to sulphation and does not deteriorate in standing idle while discharged.

Battery Charged in Vehicle

To overcome abuses of starting and lighting batteries by under- or over-charging and lack of spare batteries to take care of excessive daily current consumption, the Sarvas Electrical Co., Inc., New York, N. Y., has developed the Tritox battery charger to charge the battery automatically without removing it from the vehicle or touching the battery terminals, as shown on this page.



Before the use of the Tritox automatic charger, the battery on the tractor of Dugan Bros., Newark, N. J., had to be changed two or three times a week on account of the many tractor and trailer lights used. At the right is shown a Neon sign developed by the Sarvas Electric Co., New York, N. Y., to replace lanterns on horse wagons. It requires a battery but uses very little current.

Putting On the Gloss In Pan Coating

(Concluded from page 200)

nary coating pan, with or without ribs, or it may be one of the drum type. The inside of these pans usually is lined with a canvas and to this canvas lining is applied a heavy coating of beeswax, Carnauba wax, paraffin or a mixture of varying proportions of these substances. The slightly moist confections as completed in the coating operations are placed in the polishing pan and allowed to rotate until they have picked up sufficient wax to give a high polish. Some operators prefer to add a small quantity of a solution of the polishing waxes at the start of the operation to facilitate the polishing action. These solutions are made in any one of a number of volatile solvents which will not impart a displeasing odor or taste to the finished confection. When a high polish is obtained, the confections are removed from the polishing pan and are exposed on trays or in open containers for a day or so to insure complete drying before being placed in a closed container.

In the case of pan-coated chewing gums, the primary coatings consist of a soft undercoating obtained by applying a gum arabic solution containing a high percentage of glucose. The glucose prevents the coating from drying out and gives a soft bite to the finished piece.

Cool Air for Gum-Coating

This procedure differs materially from medicinal-confection coating in that the temperature of the air used is relatively low—about 70 deg. F. As the subsequent sugar coatings are applied, higher temperatures are used, which is the reverse to what is done in coating medicinal confections.

From this undercoating the chewing-gum center is built up with a sugar syrup (35 deg. Bé.) and the temperature of the air is gradually increased to a minimum of around 100 deg. F. Cold air is used when the last few charges of syrup are put on. This is done to smooth out the surfaces and give a smooth finish to the tablets. The polishing of these is carried out in the same manner as the polishing of medicinal confections.

When pan-coating nuts, candies and other confections with chocolate the procedure is still different, although the mechanical operations and equipment are similar.

The big difference in technique between coating with sugar syrup and with chocolate is based on the differences in the composition of the two coatings. Chocolate coatings in their simplest forms consist of cocoa or cocoa and sugar solids suspended in liquid cocoa butter, which solidifies when cooled. For this reason, cooled —not heated—air is blown into the revolving pans. Especially when the centers and/or the chocolate coating contain much sugar the air should be quite low in moisture to give the best results. A requisite in the chocolate-coating technique is that the coating be applied in such a way that it solidifies uniformly about the center and has a compact non-granular structure when viewed in cross-section.

Chocolate Needs Cold Air

The temperature of the pan room and of the air blowing into the pans should be about 60 to 65 deg. F. and the coating should be adjusted to approximately 88 to 90 deg. F. before being applied in small quantities to the centers in the revolving pans.

The subject of pan-coating with chocolate warrants separate discussion and in greater detail. However, it is well to point out that each type of center to be chocolate-coated is given a preliminary coating that will act as a binder between the center and the coating and will also aid in preventing a transfer of moisture or lower-melting-point fat from the center to the coating. Either will cause the chocolate coating to become granular in structure and discolored in external appearance during storage or shipment.

To prevent too rapid setting of the coating the centers are held for several hours, preferably overnight, at about 10 deg. F. above the temperature of the pan room. If they are much warmer than that they will not cool properly during the coating operations and their residual heat will be likely to cause discoloration and granulation of the chocolate before the goods reach the consumer.

The finishing and polishing are very troublesome operations and much is yet to be learned about the proper technique for them. In some instances they may be almost identical with those of the medicinal confections. Again the final treatment may be confined solely to polishing with waxes. In any case temperature below 75 deg. F. and relatively dry air are necessary for best results.

Putting Spice Seasoning on A Uniform Quality Basis

(Concluded from page 215)

to know that within the last few years products have been developed for seasoning ground meats, such as sausage, frankfurters, bologna meat loaves, and the like. They consist of a substantially dry, non-hygroscopic material such as sugar ground into a firm physical union with minute particles of a minor quantity of spice oils and oleoresins of peppers evenly distributed throughout the sugar.[11] These products have been called "dry soluble spices," and, as with spice-oil emulsions, exhibit many advantages in contrast to the use of ground spices.

Naturally, to maintain the constant uniformity of these products, it has been necessary to develop methods for the standardization of the raw materials entering into their manufacture. Particularly has this been true in the case of oleoresin of capsicum, which has been found to vary greatly in strength and in color.

There remains much research open to the technical colloid chemist in the further development of food emulsions for specific commercial purposes.

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[9]Clayton: "Theory of Emulsions and Their Technical Treatment," pp. 175, 176, 183; 1928.
[10]Alsberg: "Process of Emulsification," U. S. Patent 1,545,993; 1925.
[11]Allen: "Condimentation of Ground Meats," U. S. Patent 1,781,154; 1930.

Stop Rat Holes With Glass

Perhaps the next worse thing to having a rat in a food plant is to chase one in its hole and fill in behind it with concrete, then find next morning that it has dug out your plug and come back to tease you again. Rats have no trouble in digging through concrete, even after it is several hours old. This often may be stopped by filling the hole nearly full with a single stone or brick and locking it is place with concrete. In many instances, however, a cement mixture plentifully supplied with broken bottles will prove more effective and easier to apply. For best results the glass should be in pieces averaging about the size of a twenty-five cent piece, and all shapes.

HARRY STINER, *New York, N. Y.*

Spark-Proof Portable Power

No electric sparks could be tolerated in the dust-laden explosive atmosphere of the mixing room at Rumford (R. I.) Chemical Works. Consequently, to supply electrical energy to drive the two portable mixers and to propel them back and forth along the steel track presented somewhat of a problem. The difficulty was overcome by supplying the current to each of the mixers through 50 ft. of "Tirex" No. 8 cable wound on a reel suspended from the ceiling. Spring motors on the reels wind up the cable or permit it to unwind according to the movement of the mixer along the track. Guide boxes mounted on angle-iron uprights receive the cable at the mixers, curved wooden blocking being provided inside the boxes to minimize wear on the cables. A short run of cable terminates at a junction box below the guide box, and from there the conductors are carried in 1-in. iron conduits to the motor starters. Gas-tight oil-break starters for the motors and gas-tight collectors for the reels complete the job of making the electrical supply system for the mixers explosion-proof.

Keep Forearms Horizontal

Workers perform at their highest efficiency when their position with respect to their bench is such that their forearms are about horizontal. If they reach down or up to their work they not only are slower but they tire more quickly.

Since the position of the arms depends upon the worker's height, some provision must be made to compensate for the physical differences among workers standing at the same bench. This can be done with the aid of duckboards of different heights for the employees to stand upon. These may be made by nailing boards to wooden blocks as shown in Fig. 1. Some of the blocks should be about 1 in. high; others, 2 in.; and still others 4 in. Another type is shown in Fig. 2. Narrow pieces planed down between the ends to form openings between adjacent pieces, are used in the footboard. This allows small objects, such as raisins, to pass through instead of piling up when they are dropped.

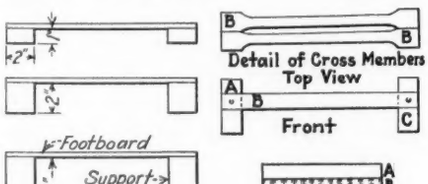


FIG. 1 FIG. 2

The springiness of duckboards provides welcome relief from standing on concrete.

Aid to Loading

Saw-tooth loading docks of the type shown here permit trucks to be loaded or unloaded from the side and the end at the same time.

Oversize Pipe Wastes Steam

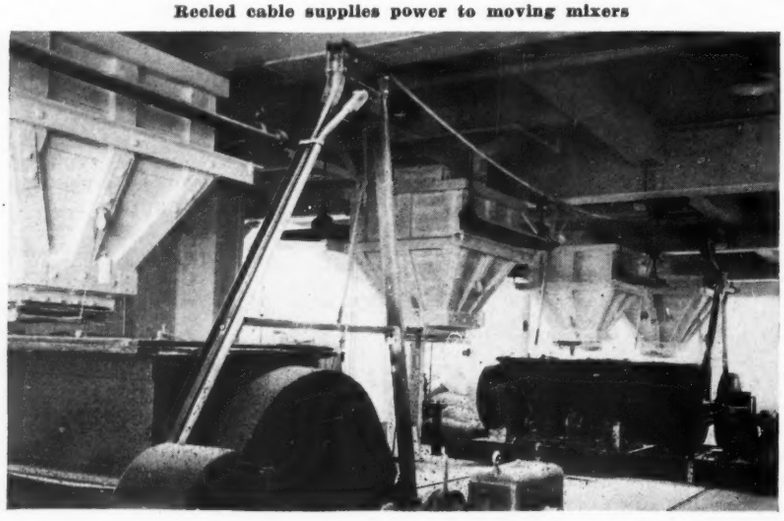
When installing steam lines, care should be taken to avoid using pipe that is too large. In addition to the higher initial cost, the larger pipe imposes a penalty of greater radiation losses. This may represent a serious waste in large systems.

The following data will illustrate the heat loss: With steam at 160 lb. pressure, 100 ft. of 6-in. pipe covered with 1½-in. insulation will radiate the equivalent of 17 lb. of steam per hour, whereas 100 ft. of 4-in. pipe with the same covering and at the same pressure will radiate the equivalent of only 12½ lb. of steam per hour. The loss is even more pronounced where the pipes are uncovered, being, in the case of the 6-in. pipe, 160 lb. per hour, and with the 4-in. pipe, 112 lb. per hour.

The correct pipe size should be determined from a handbook after present and future steam requirements have been calculated.

S. H. COLEMAN, *Waynesboro, Va.*

Reeled cable supplies power to moving mixers



IN THE CURRENT OF EVENTS . . .

- *AAA to bait flour millers with compromise pact*
- *Major food codes reach last stages of long journey*
- *Dairymen kick over traces on production control*
- *Canners pigeonhole three marketing agreements*
- *Strong free-trade bloc loses in sugar fight*
- *Copeland bill now the forgotten measure*

AAA Will Compromise With Millers; Draws Up Substitute Code

Judging from recent moves by the A.A.A., it seems likely that the break between the Recovery Administration and the flour-milling industry soon will be patched up. It was the attempt on the part of A.A.A. to curtail the "stop-loss" provision of the proposed milling code that led the industry's code committee to abandon negotiations on March 31. And in the hope of getting the industry back in line, A.A.A. has drafted an alternative pact with stop-loss provisions supposedly patterned after those which the millers advocated. This has been referred to Secretary Wallace, General Johnson and Administrator Chester Davis. Following approval by these officials, it will be submitted to the industry.

Based upon data which it took Millers' National Federation six years to collect, the code proposed by the millers asked a minimum selling price (stop-loss) of 85 per cent of the average cost of administration, manufacturing and inside selling expenses, plus the cost of the wheat. N.R.A. officials (who have jurisdiction over part of the code) would have let 75 per cent pass, but the A.A.A. said no, desiring to reserve minimum prices for producers, as it is now doing in its dairy program. It also wanted to make other changes which, in the opinion of the millers, would have rendered their code of fair competition of no practical value.

The effect of the stop-loss provision, so one authority puts it, would be to prevent the "destructive" volume sales sometimes made to large purchasers at prices from 10 to 25c. a barrel below production costs. If adopted, it probably would also increase flour prices by 10 to 25c. a barrel. Moreover, it would seem to have a tendency to make the minimum price also the maximum one.

Other provisions of the code have been practically settled. The 90-day-sales basis has been accepted together with provisions regarding carrying charges, package and self-rising differentials, elimination of rebates and premiums, and the rest of the trade-practice schedule. Representation for all classes of mills has also been agreed to. Labor provisions have been brought to a satisfactory basis, with the industry victorious in the continuation of the minimum wages provided in the temporary labor code. N.R.A. sought an advance of 13c. an hour from this basis originally, reduced it to 2½c. and later agreed to the original proposal of the industry.

Conflicting opinions exist in the A.A.A. concerning the code situation. The so-called young liberals that were identified with the Adjustment Administration's alleged brain trust during the Wallace-Peek battle liken the industry code to the packers' marketing agreement, declaring that it would give the trade power to do anything it wanted under the A.A.A. without regulation by the government. The other side holds that, while the millers might be too unyielding in the efforts that have been made so far to arrive at an agreement, the trade might well be justified in taking such a stand.

Speculation that the government will attempt to force the industry under a code in the event an agreement cannot be reached has been squelched at the A.A.A. The recovery act gives the President such power, but A.A.A. officials declared that it would be "far fetched" to presume that such action will be taken. They held that it would be practically impossible, as it would mean the active policing of about 6,000 units in the industry.

Major Food Codes Near Approval As Minor Pacts Are Signed

Food-code making at the N.R.A. progressed rather rapidly during the past month. While none of the codes for the larger industries had been signed up to the time FOOD INDUSTRIES went to press, several were in the final stages and four minor ones had been approved.

The codes that were signed include those for the peanut-butter, wholesale lobster and New York live poultry industries. Among the pacts ready for final action are those relating to grocery manufacturing (master code), canning, baking, bottled soft drinks, cocoa and chocolate, malt products, preserved and glacé fruit, yeast and vinegar. In the process of whipping the food codes into shape, the Administration conducted hearings on those covering the manufacture of yeast, tea, licorice, oleomargarine, natural organic products, malt products, desserts and baking powder. Hearings have been scheduled in May for prepared meats, biscuit and crackers, Pacific Coast halibut and Alaska herring industries.

Effective April 14 and containing a 60-day stay of price-filing provisions, the code for the peanut-butter industry establishes a 40-hour week, with 48 hours for deliverymen, and puts minimum wages at 40c. an hour in the North and 35c. in the South; the differential for women amounts to 7½c. in the North and 10c. in the South.

Under the approved wholesale lobster code, which takes effect April 23, buying, selling or dealing in whole lobsters measuring less than 3⅛ in. or more than 4¾ in., carapace measurement, will be prohibited. This divisional fishing code adopts the master code's labor provi-

New Thunder Bird

General Johnson's famous feathered friend has been placed upon a new perch to create the "Code Eagle." This emblem will distinguish employers operating under approved codes—providing they behave properly. The single word "Code" replaces the legend "We Do Our Part," and beneath appears the name of the trade or industry. The effective date is May 1.

sions, with some exceptions. The drafting of the divisional fishing codes is meeting with great difficulty because of lack of unity. Unlike the agricultural industries, the fishing trades come within the scope of the anti-trust statutes, and they may not legally unite in establishing a common sales agency. The need of securing for the fishermen a status similar to that of farmers has been so emphasized since the Recovery administration began to function that legislation in behalf of the industry has been introduced and hearings held.

The live poultry industry of New York, the market price set by which serves as a guide for the industry throughout the nation, must work out a better system of daily market quotations, its code specifies. Other provisions of the pact provide that wholesale slaughter houses are entitled to a fee of 35c. for returning coops to the coop company and prohibit the slaughter of poultry on any basis other than "straight killing." The latter provision means that the slaughter houses cannot, as they have in the past, take select fowls at the market price and leave the culls to be sold at a sacrifice.

With the opposition simmered down to a few small industries which feel that their independence will be lost in a master code, the proposed trade practices for the grocery manufacturing industry are expected to be signed soon. The task of making a code that would provide a general plan of operation for some 50 separate industries has been all but insurmountable. The magnitude of the difficulties was evidenced by objections voiced at the public hearing, where most of the witnesses indorsed the proposed code in principle but asked that their own industries have absolute autonomy over their own problems.

After a delay chiefly caused by differences over labor provisions, the baking code has gone to the White House and should be signed shortly. The argument over labor related mostly to hours of work, with the bakers using hand workers holding out for longer hours than allowed by the 40-hour week. The mechanized branch of the industry maintains that hand workers are not in direct competition with machinery, being mostly engaged in specialized baking.

With a compromise on labor provisions effected after weeks of negotiations between industry and the N.R.A., the cocoa and chocolate industry code has reached the final stages of approval and is expected to be signed by the President by the time this is in print. The labor provisions as they now stand are understood to involve a maximum week of 40 hours and minimum wages of 42½c. an hour for men and 37½c. for women. These rates represent an increase of about 5 per cent over those originally proposed.

At a meeting of canners and N.R.A. representatives the middle of April, the proposed canning code is understood to have received the approval of both sides. The joint acceptance of the code supposedly followed a compromise on labor provisions, a bone of contention since the February hearing.

In the present version of the code for the bottled soft-drink industry, which is near approval, hours of employment have been altered to permit a peak season of sixteen 44-hour weeks, with an additional period of six 54-hour weeks, this being done to take care of "a peak within a peak." The manufacturer may use the "peak weeks" at any time during the year.

JAY GOULD

Best Foods' general manager was elected chairman of the Mayonnaise Code Authority at a meeting of industry representatives in Chicago early last month. Several changes in the code were suggested at this meeting.

WHERE CODES STAND

APPROVED		
Beet Sugar (Labor Provisions)	Oct. 27	NRA
Brewing	Mar. 22	NRA
California Sardine Processing	Apr. 24	NRA
Chewing Gum	Jan. 30	NRA
Coffee	Feb. 6	NRA
Fishing (Master Code)	Feb. 26	NRA
Fresh Oyster	Mar. 10	NRA
Grain Exchanges	Mar. 20	AAA, NRA
Imported Date Packing	Nov. 11	NRA
Macaroni	Jan. 29	NRA
Mayonnaise	Mar. 21	NRA
New York Live Poultry	Apr. 13	NRA, AAA
PeanutButter	Apr. 4	NRA
Raw Peanut Milling	Jan. 12	NRA
Retail Food & Grocery Trade	Oct. 21	NRA
(Labor Provisions)	Nov. 15	NRA
Southern Rice Milling	Nov. 21	AAA
Tapioca Dry Products	Mar. 12	NRA
Wholesale Food & Grocery	Jan. 4	NRA
(Labor Provisions)	Nov. 15	NRA
Wholesale Lobster	Apr. 13	NRA
Associated Industries		
Can Manufacturing	Dec. 15	NRA
Canning & Packing Machinery	Jan. 27	NRA
Cap and Closure	Oct. 20	NRA
Crown Manufacturing	Nov. 1	NRA
Fiber Can and Tube	Feb. 25	NRA
Merchandise Warehousing	Jan. 27	NRA
Packaging Machinery	Oct. 31	NRA
Sanitary Milk Bottle Closure	Mar. 27	NRA
HEARINGS SCHEDULED		
Alaska Herring	May 4	NRA
Biscuit and Cracker	May 8	NRA
Pacific Coast Halibut	May 3	NRA
Sausage & Prepared Meats	May 3	NRA

Canners Reluctant to Sign Marketing Agreements

While officials of the A.A.A. shy off the subject, there is considerable talk in authoritative circles at Washington concerning the reluctance of canners to enter into marketing agreements this year. Tentatively approved by the A.A.A., agreements providing for fixed returns to producers have been in the hands of packers of corn, tomatoes and peas for more than a month. A.A.A. refuses to say how many of them have been returned signed, contending that because of the "short" time they have been out such information would be no indication as to their acceptance by the trade.

The reason being advanced for the withholding of signatures by canners is that contracts for canning acreage are close to the prices specified in the agreements and the trade is unwilling to bind itself unnecessarily.

Whether or not the A.A.A. is worried at this reported attitude is a matter of conjecture. There is understood to be sentiment in the administration that it would be of benefit to the trades if the agreements were accepted. None of the agreements provides for allocation of the pack or acreage control as was originally contemplated. In rejecting the proposal the administration gave as its reason lack of statistics. Signatories to the agreements would have to furnish such information, which it is understood may be used for allocating next year's pack.

Beef, Peanuts and Barley Now Basic Commodities

Taking time out during his fishing expedition in Southern waters, President Roosevelt on April 7 signed a bill making basic commodities of beef, peanuts, barley and grain sorghums. With this action, these commodities are subject to a processing tax. Opposed by the A.A.A. on the ground that it would add new burdens to an already overloaded program, this measure authorizes appropriations of $250,000,000. Of this, $200,000,000 would finance dairy and beef cattle adjustments, being recovered through the processing taxes paid by meat packers. The other $50,000,000 would be spent outright for the purchase of dairy and beef products for relief purposes and for elimination of diseased dairy and beef cattle.

Stays Macaroni Prices

A further stay in the Macaroni Code provisions requiring a waiting period between the time of filing prices and their effective date was announced April 20 by Administrator Hugh S. Johnson. This stay will remain in effect until

such a time as the Administration has completed a study of the open-price provisions of the pact.

When the code was approved Jan. 29, the open-price provisions were stayed for 60 days. A subsequent order on Feb. 17 extended the stay to 60 days from that date but limited it to the waiting period requirement.

Evaporated Milk Charges Aired at Chicago

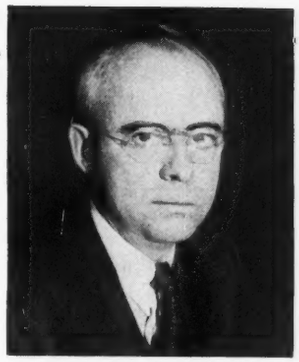
The disturbance in the evaporated-milk industry concerning charges and counter charges of violations of the marketing pact were aired at a Chicago meeting of the industry late in April. Of three manufacturers charged by the Department of Agriculture with violation of the agreement, one, the United Milk Products Co., Cleveland, has been released from the proceedings. The cases of the other two firms, United Dairy Co., Barnesville, Ohio, and the Dairy Belt Milk Products Co., Spencer, Wis., have been postponed by agreement of counsel.

In dismissing the United Milk Products complaint, the department said that the company understood it had the right to withdraw from the agreement and had filed notice that it intended to prior to the alleged breach of the pact. Upon notice that it did not have that right, the company agreed to comply with the agreement, it was stated. The other two companies were charged with sales below the price schedules in the agreement.

A.A.A. Cites Six Dairies

Six dairy companies in the Chicago area last month came under the suspicious eye of the A.A.A. when they were cited as alleged violators of the Chicago milk-marketing agreement. They were: Joseph Wagner Dairy Co., Cicero; West Side Dairy Co., White Eagle Dairy Co., Midland Dairy Co., and Lemont Dairy Co., Chicago; and Red Top Milk Co., East Troy, Walworth County, Wis.

All of the concerns were charged with similar violations. They are alleged to have bought milk from new producers without obtaining permits and from producers without recognized established bases. They are also charged with buying milk from producers without making required reports to the market administrator and without making payments on the milk continuing to be so purchased. They are said to have failed to pay established prices and to buy all the milk offered them by the producers. Finally, they are charged with failure to pay for a butter-fat differential of 4c. per point in the fat test above the standard 3.5 per cent.



CHESTER C. DAVIS

Believes dairy industry may accept plan after it has had "a little more experience" with surpluses.

A.A.A. Abandons Dairy Plan As Producers Object

In the first farmer revolt against the A.A.A.'s key policy of controlled production, dairymen in important milk-sheds piled up so much opposition to the $165,000,000 dairy-control program that it had to be abandoned. After nearly a month of regional meetings in which producers voiced their reaction to the plan, Chester C. Davis, administrator of the Agricultural Adjustment Act, on April 23 announced that the program had been definitely dropped, "for the present, at least." Looking ahead, Administrator Davis ventured the veiled prediction that the industry might accept the plan after it has had "a little more experience" with the problem of surplus.

Chief objectors to the production-control plan were the cooperatives, among them National Cooperative Producers' Federation and Regional Producers' Cooperative Federation. Many of the State milk-control boards also lined up with the opposition, the New York and New Jersey boards publicly condemning it with the contention that there was no surplus of dairy products in their respective States. The A.A.A. attributes the producers' attitude to the fact that the opposition, "under central leadership," developed before the proposed program was submitted at the regional meetings and before the A.A.A. had a chance to tell its story.

According to the provisions of the plan (FOOD INDUSTRIES, April, page 178) producers would receive something like $165,000,000 in benefit payments for reducing production from 10 to 20 per cent of the 1932-33 average. These funds would be raised by processing taxes on butter fat, starting at 1c. and gradually advancing to 5c. a pound.

There are strategists in the Adjustment Administration who see the blocking of the scheme, should it turn out to be only temporary, as a good break for the administration. Had the plan gone into effect and the price of milk declined with the seasonal peak, opponents of the program could have attributed it to the effect of the processing tax.

Sugar Bill as Approved by Congress Favors Continental Industry

Finally approved by Congress, the new amendment to the Agricultural Adjustment Act for stabilization of the sugar industry is considerably revised from the Administration's original proposal and represents a major defeat for free-trade advocates within the government.

The major revisions in the approved sugar bill are fixing of definite quotas for continental cane- and beet-sugar production instead of leaving the allotments to be determined by an unsympathetic Secretary of Agriculture; limitation of imports of refined sugar, directly a protectionist move, and an increase of 100,000 short tons in the quota for beet sugar above that proposed by the President, putting it at 1,550,000 short tons.

The fight for revision against the Administration sugar bill opened with the first day of hearings on the proposal. Drafters of the legislation made the mistake of offering as their first witness one of their most earnest and honest free-trade advocates, A. J. S. Weaver, head of the A.A.A. sugar section. His blunt admission that the legislation would be used, after enactment, to "freeze" domestic production of sugar, because it is an "uneconomical industry," was the spark that fired sugar States' representatives in Congress into action. The particularly militant and strong bloc of beet States Democrats, with their fears that the measure was to be administered by an unsympathetic A.A.A. confirmed, worked vigorously. And with threats to bolt on other Administration proposals they forced amendment of the legislation to fix continental quotas and increase the beet-sugar allotment.

Domestic refiners had sought to limit imports of direct consumption sugar, and thought they had sufficient political connections to accomplish this. Instead, they were confronted in the A.A.A. by high ranking officials, some of whom had been previously identified with the Cuban sugar industry. Identified with the "back room" movement were Assistant Secretary of Agriculture Tugwell, Charles W. Taussig and A. A. Berle, Jr. The latter were president

and director-counsel, respectively, of the American Molasses Co., Cuban sugar refinery. Then there was the general counsel of the A.A.A., Jerome Frank, formerly of counsel for Thomas L. Chadbourne, well-known Cuban sugar operator.

The refiners took their cases to Congress, however, and succeeded in having imports of direct-consumption sugar from Cuba limited to 22 per cent of the total quota granted that island by the Secretary of Agriculture under the sugar bill.

10c. Tax on Margarine Asked in Federal Bills

Long the target for State and federal taxes, oleomargarine comes under fire again. A bill introduced by Senator Ellison D. Smith stipulates a tax of 10c. a pound on all margarine containing fats and oils not produced within the United States. Another bill in the House, known as H.R. 9122, places the same levy on oleomargarine.

Other clauses in the Senate bill provide that all margarine be manufactured under the inspection of the Bureau of Animal Industry, that the products be sold to the consumer only in the manufacturer's original package, that a standard margarine contain 82½ per cent of fat and that false advertising be prohibited.

Sets Coconut Oil Tax at 5c.; 3c. for Philippines

Compromising on the controversial tax on coconut oil, the Senate-House conference on April 25 agreed upon a levy of 5c. a pound with a 2c. preferential for the Philippine Islands. The other vegetable and fish oils enumerated in the 1934 Revenue Bill will be taxed at the 5c. rate, but with exemptions for sperm oil, halibut liver oil, and perilla oil. By virtue of the preferential on coconut oil, the Philippines will have a monopoly on the American market for that product. However, the tax represents an ad valorem value of about 130 per cent, making it virtually prohibitive. Proceeds from the tax are to go to the Philippine treasury, with the restriction that they may not be used to subsidize the coconut-oil industry.

Lard, Pork Exports Cut

Import restrictions continue to destroy what for many years was an important market for American lard. The latest action limits imports of lard into Germany to 40 per cent of the average imports for corresponding months of 1931-33. According to the A.A.A., United States shipments to that country during 1934 may not exceed 65,000,000 lb., as against 125,000,000 lb. taken last year. In the early post-war years, Germany annually purchased an average of about 250,000,000 lb. of American lard.

England also continues to limit imports of pork products. United States shipments of bacon, hams and shoulders to the United Kingdom last year were 56 per cent under the 1926-30 average. Recently established quotas are 3½ per cent larger for the second quarter, but smaller by 4½ per cent for the remainder of the year.

Passage of Copeland Bill Considered Unlikely

Proposed amendments to the pending Copeland Food and Drug Bill continue to pile up. Meanwhile, Congress has been taking very little action on the measure, and in the short time remaining in this legislative session it seems most unlikely that the bill will be put through.

Among the recent proposed amendments are fourteen issued by Associated Grocery Manufacturers of America. These amendments apply to practically all of the major provisions of the bill, with particular attention to labeling requirements, definitions and standards, administrative features and advertising. National-American Wholesale Grocers' Association also has suggested an amendment. It would change Sec. 25 (a) of the Copeland Bill to allow eighteen months after the bill goes into effect for manufacturers, canners and wholesale grocers to dispose of labels and containers that would not meet the branding requirements of the bill.

Labor Still Troublesome In Food Industries

Now that N.R.A. Administrator Hugh S. Johnson has extended to all codified industry the "Board-of-Three" plan developed to settle the Detroit automobile strike, labor disputes may be less troublesome. However, the food industries were not without them during the past month. Workers employed at the Camden (N. J.) plant of Campbell Soup Co. walked out on April 1, and Canners' Industrial Union of America placed more than 200 pickets around the plant. The union demanded full recognition, abolition of a company union, elimination of piecework and wages equivalent to those of 1929. The plant was closed for a time, but reopened April 10, with an invitation to all employees to return to work. No immediate adjustment was made in wages. However, the company has increased wages in its Chicago plants to a point 10 to 15 per cent above the code level.

Union bakers in St. Louis have requested a six-hour day in wholesale plants and a seven-hour day in retail shops at the same wages as now received for an eight-hour day. There also was trouble in the brewing industry in St. Louis. The local union of transfer teamsters and chauffeurs interfered with the delivery of beer by drivers working under United Brewery, Flour, Cereal and Soft Drink Workers of America. The transfer teamsters claimed the right to do this work under a ruling of American Federation of Labor.

Employees in the rice-milling indus-

Photo by Charles Phelps Cushing

Maple Syrup Time

When the snow begins to melt and the sap to run, maple-syrup manufacturers dust the cobwebs off their little plants among the maples, tap the trees and set the juice to boiling. The cameraman caught this typical Vermont sugar house at the height of its activity. It's the bush of C. B. Kelly and is near Derby Line close to the Canadian border.

try will have shorter hours if recommendations made by Frank A. Godchaux, president of Louisiana State Rice Milling Co., are accepted. His plan calls for a six-hour day from Jan. 1 to Sept. 15 and an eight-hour day from Sept. 15 to Dec. 31. An increase of 10 per cent in wages would accompany the change in hours.

Wrigley Compensates Labor During Layoff Periods

Stepping ahead of the trend toward compensation of labor during temporary unemployment, William Wrigley, Jr., Co., Chicago, has introduced an employment insurance plan. To each employee who has been with the company six months or more, and who gets $6,000 a year or less, the company will give a contract of employment covering a definite period and remaining in operation from year to year unless cancelled. If business conditions necessitate layoff, the employee will be compensated for 16 to 28 weeks, depending upon length of service, at a rate based on his wages.

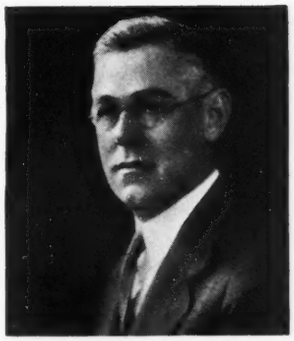
In the case of weekly pay, compensation will be 80 per cent of the base rate, if the latter is $24 a week or less; 60 per cent if between $24 and $48; 40 per cent if between $48 and $72; and 28 per cent if above $72. As to period of compensation, if the employee has been with the company less than two years, he is entitled to 16 weeks' lay-off pay; if between two and five years, 20 weeks; between five and ten years, 24 weeks; more than ten years, 28 weeks.

FTC Bars Candy Lotteries

Fifty-one candy manufacturers with headquarters in 14 Eastern and Mid-Western States recently received cease and desist orders from the Federal Trade Commission. These orders prohibit them from employing lotteries, gaming devices or gift enterprises in the distribution and sale of candy. This action follows the Feb. 5 ruling of the Supreme Court, which upheld the Commission's decision against R. F. Keppel & Bro., Lancaster, Pa., in a case involving similar practices.

Tuna Conference Fails

After trying for three weeks to reach an agreement with Japanese tuna-fish interests on the quota they may ship to this country, American packers and fishermen are giving it up as a bad job. The Japanese want to supply half the tuna consumed in the United States, but domestic canners and fishermen set the limit at 10,000 tons. And they are relying upon Washington to protect them against a flood of Japanese imports and relentless underselling.



JOHN VONEIFF

He will represent National Confectioners' Association in the United States Chamber of Commerce, having been recently appointed national counselor for the organization. Mr. Voneiff is connected with Voneiff-Drayer, Baltimore, confectionery manufacturers. From 1916 to 1921 he was engaged in the jobbing end of the industry.

HORS D'OEUVRES

WHEN THE GOVERNMENT this month disposes of the final lot of Santos coffee (37,500 bags), Uncle Sam will have made a neat profit of over $2,000,000 from the celebrated wheat-coffee barter with Brazil. This is one Hoover heritage the Democrats can't kick about.

•

A DRINK of warm milk in the middle of the afternoon reduces that "last-hour slump," a psychological expert has found. But Tugwell has a better remedy. He would do away with the "last hour."

•

ABOUT A YEAR AGO, Wesson Oil brought out a combination package containing a device for whipping mayonnaise and a can of oil for making the product. But the company now offers, through a subsidiary, a finished mayonnaise. Apparently the housewife would rather buy it than beat it.

•

STUDIES have indicated that coffee peps up the drinker for about three hours and then slows him down, that it causes the diner to eat less food, and that its toxic effect is less when taken with alcohol. This is all very interesting, but counteracting caffeine with alcohol seems a bit facetious.

•

A BIOLOGIST has found that combinations of meat and milk extracts have caused marked "potentiations of toxicity." Which, if it means what we think, would seem to give Jewish dietary regulation a practical purpose.

•

A CHICAGO newspaper columnist recently pointed out that by increasing the number of cats to 120,000,000, milk consumption could be boosted 40-fold, bringing prosperity to farmers, the dairy industry, equipment makers and, in fact, to the entire country. Sort of a "puss-on-every-porch" program of recovery.

Shrimp Packers Revise Canning Methods

Having suffered heavily from spoilage last year, some of the shrimp canners are revising processing methods. Acting on recent recommendations by Norman Hendrickson, director of the shrimp section of National Canners' Association, these packers are adopting for No. 1 cans of wet pack shrimp pressure cooking for 12 minutes at 250 deg. F. This, Mr. Hendrickson says, will materially lengthen the time that good shrimp will keep in a salable condition.

To minimize softening, the canners have been advised to shorten as much as possible the interval between filling the cans with hot brine and processing them. This should be done even if it is necessary to use smaller loads in the retort. And when cooking is completed, cooling should be prompt and rapid. Mr. Hendrickson also has recommended preliminary brining of the peeled shrimp just before bleaching. This firms the product and gives it a brighter and better appearance in the can.

Patent on Fruit-Washing Goes to Government

After nearly seven years of litigation, priority rights to a process for removing poisonous spray residues from fruits and vegetables has been awarded to Arthur M. Henry, of the Department of Agriculture. This means that food processors may use the method without paying royalty in it.

The method covered by the Henry patent consists essentially in the removal of spray residues containing such poisons as arsenic and lead by washing the fruit or vegetables with dilute alkali and acid solutions, followed by rinsing and drying. The process has been in use for several years.

Samples of Frozen Fruits, Vegetables Examined

Information of important practical value to packers of frozen foods was brought out in the examination of samples recently prepared and exhibited by the Bureau of Plant and Dairy Industry. Perhaps the most interesting discovery to come from these samplings was the fact that the color, appearance and flavor of Golden Bantam corn frozen on the cob and frozen cut cream style were superior to those characteristics of heat-processed corn. All samples had been packed in 2-per cent brine, freezing and storing having been done at —5 deg. F.

Among the strawberry exhibits, all but one of which were packed in 60-deg. syrup, the only samples having off-flavors had been packed in paper cups. The cause was recognized as the

presence of chlorides in the paper. Practically all of the samples in cans were superior in color and flavor to those in paper cups. Missionary, Klondike and Redheart were shown to be good varieties for freezing, with Fruitland meriting further study.

Of the peaches sampled, Up-to-Date and J. H. Hale both were far superior in flavor to their nearest rival, Primrose. N. J. 66325 had a superior color, even better than Up-to-Date, which again was far ahead of remaining samples. Two varieties of cherries, packed in 40-deg. syrup, in both tin and paper containers, were sampled, and there was no particular difference between the samples packed in tin and in paper. Other fruits tested were raspberries, youngberries, loganberries and cranberries.

In addition to the corn, several samples of frozen vegetables were tested. Alderman and Telephone varieties of peas were examined, and little difference could be detected as to color, flavor and texture. All samples turned out to be far superior in flavor and color to a heat-processed sample of the Telephone variety. In the case of yellow wax beans, samples heat-processed in 2-per cent brine had better texture and appearance than either the samples packed dry or those frozen in 2-per cent brine. The heat-processed sample, however, had poor flavor. Of the green snap beans examined, the Kentucky Wonder was superior in texture and flavor to the Blue Lake in both the frozen and heat-processed samples. Asparagus and spinach also were sampled.

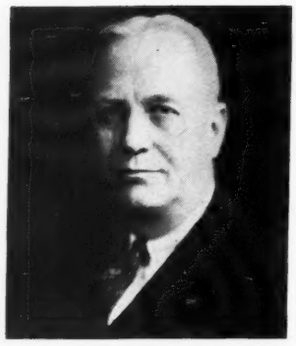
New York Licenses Canners; Bakery, Dairy Bills Up

Legislation of far-reaching effect on the food industries has been taking place in New York State. On April 1, there went into effect a law requiring canners operating in the State to be licensed and to give a minimum bond of $10,000.

Nor is the canning industry the only one at the mercy of the Empire State legislators. Pending before the Assembly is the Esquirol-Moran bill which requires bakers and dealers in bread and pastry to be licensed. This bill would prevent the return of stale bread or pastry.

A third measure, the Ostertag bill, provides for a milk publicity bureau to increase the consumption of milk and milk products. It would impose an excise tax of 1c. on each 100 lb. of milk and a corresponding tax on other dairy products.

A bill to license slaughter houses was passed by the Senate late in April. Under it the action of the Commissioner of Markets in refusing or revoking a license would be final. The Sheldon bill taxing oleomargarine was defeated.



WILLIAM F. R. MURRIE

President of Hershey Chocolate Co., Mr. Murrie was elected head of Association of Cocoa and Chocolate Manufacturers of the United States at the annual meeting held in New York recently. Other officers include Stephen P. Goble, vice-president of Rockwood & Co., and Marvin J. Dodd, secretary of Hooton Cocoa Co., who are vice-president and treasurer, respectively. Members of the industry attending the meeting characterized the proposed cocoa and chocolate code as quite satisfactory.

Salmon Fishermen Strike

Having gained an advance in their price last year by a well-organized strike, salmon fishermen on the Columbia River have resorted to the same tactics again this season. The strongly organized fishermen ask a minimum of 11c. a pound for Chinook until Aug. 10. From that time until Aug. 25, they want 8c. The nearest thing to a compromise is the packers' offer of 9c. up to Aug. 1. While this is 1c. more than paid last year, the fishermen seem to have no intention of accepting it.

Labor troubles also are harassing the canners. Union leaders demand 65c. an hour and the abolition of piecework, neither of which the packers feel disposed to grant.

CONVENTIONS

MAY

Second Week—National Malt Products Manufacturers' Association, quarterly. S. L. Goldman, 160 North LaSalle St., Chicago, Ill.

14-16—American Institute of Chemical Engineers, semi-annual, Waldorf-Astoria, New York, N. Y. Frederic J. LeMaistre, secretary.

31—Rice Millers' Association, annual, F. W. Ferrer, 1102 Queen and Crescent Bldg., New Orleans, secretary.

JUNE

4-5—National Cottonseed Products Association, New Orleans, La.

4-8—American Association of Cereal Chemists, Royal York Hotel, Toronto, Ont.

4-8—Association of Operative Millers, Royal York Hotel, Toronto, Ont. C. W. Partridge, 516 Board of Trade Bldg., Kansas City, secretary.

10-12—New England Bakers' Association, New Ocean House, Swampscott, Mass.

11-12—Certified Milk Producers' Association of America, Statler Hotel, Cleveland. Dr. Harris Moak, 360 Park Place, Brooklyn, N. Y., secretary.

11-12—American Association of Medical Milk Commissions, Statler Hotel, Cleveland.

11-15—National Confectioners' Association, convention and exposition, Waldorf-Astoria Hotel, New York, N. Y.

17-19—American Millers' Association, New Century Hotel, Dawson Springs, Ky. T. W. Vinson, Watterson Hotel, Louisville, secretary.

21-23—Flavoring Extract Manufacturers' Association, Waldorf-Astoria Hotel, New York, N. Y.

26-28—American Dairy Science Association, Ithaca and Geneva, N. Y.

CONCENTRATES

A.A.A. has begun a survey of milk consumption among school children in 50 representative cities . . . National Emergency Council has taken over the voluntary consumers' councils in 120 cities and towns (soon to be 200) . . . To develop and test non-poisonous organic insecticides for combating inroads of the codling moth on apples the Department of Agriculture has been allotted $203,215 by P.W.A.

United States will request an enlargement of its export quota under the international wheat agreement to 140,000,000 bu., effective Aug. 1, 1935, it is reported . . . Some of the confusion is expected to be taken out of the methods of rating vitamin content of foods by action at the second International Conference on Vitamin Standardization, to be held in London June 12-14.

Federal Surplus Relief Corp. has invited bids for supplying 2,500,000 lb. of American cheese, and also processed cheese . . . Contracts for 11,625,000 lb. of commercial cuts of pork have been awarded 34 packers, while four were granted contracts for 2,460,000 lb. of steamed lard, all for relief purposes . . . National Canners' Association is establishing a division of statistics to collect information for its industry . . . Terming the legend unwarranted and unreasonable, U. S. Circuit Court of Appeals recently granted Morgan Packing Co., Austin, Ind., a permanent injunction against labeling canned soaked dry peas, "Below U. S. Standard. Low Quality, But Not Illegal. Soaked Dry Peas."

Vitamin B-sub 1, the cure for beri-beri present in the husks of rice, has been isolated by Dr. Robert R. Williams, of Bell Telephone laboratories, New York . . . Emulsol Corp.'s suit against Standard Brands for use of a mayonnaise process was settled out of court, Standard Brands making payment and receiving a license . . . Introduction of natural American Cheddar cheese in cans is expected soon by Great Atlantic & Pacific Tea Co., Swift and Co., and Nestles Milk Products, Inc. . . . Railroad tariff rates for shipments in cars refrigerated by the silica gel system have been reduced by Safety Refrigeration, Inc., to those applying under Standard Refrigeration service, where ice is used.

MEN . . . JOBS . . . AND COMPANIES

Industry

F. M. Ball & Co., Oakland, Calif., has acquired a modern cannery there with a capacity of nearly 1,000,000 cases a year. Both fruits and vegetables will be packed.

Beech-Nut Packing Co., Rochester, N. Y., is building a four-story addition to its plant.

Brennan Packing Co., Chicago, has been acquired by Wilson & Co. at an approximate cost of $2,000,000. The plant has a slaughtering capacity of about 1,500 hogs daily. The business was established in 1897 as the National Provision Co.

California Packing Corp., San Francisco, has terminated its agreement with Maui Pineapple Co., growers, to pack and market fruit grown on a profit-sharing basis.

Carnation Co., Milwaukee, has leased the Tennessee Cereal Co. plant near Nashville and will operate it experimentally for the next few months.

Drew Canning Co., Ltd., San Jose, Calif., has acquired the J. C. Ainsley Packing Co. plant, Campbell, having operated it formerly under lease.

Fleischmann Malting Co., Minneapolis, will make additions to its plant, to cost $10,000.

Franklin Brewing Co., Columbus, Ohio, recently marketed "Ben Brew" beer, made in accordance with the 100 per cent grain formula.

Garoni Products Co., Chicago, maker of garlic juice, has been renamed Vegetable Juices, Inc.

General Mills, Inc., Pillsbury Flour Mills Co. and Russell-Miller Milling Co., Minneapolis, advanced wages 10 per cent last month.

Gloucester (Mass.) Seafoods Corp. plant was damaged by fire March 30, at a loss of $15,000.

Golden State Salami Co., Oakland, Calif., plans a new $200,000 factory.

Green Mountain Maple Products Association, Burlington, Vt., has been formed to produce and pack maple sugar and syrup.

Griffin Products Co., Niles, Mich., is to begin production of peanut butter, mustard and other condiments in the near future, according to J. A. Griffin, president.

Hershey (Pa.) Chocolate Corp. has created a new post in engaging Alexander Stoddart, formerly newspaper man, as publicity representative.

A. C. Hunt Co., Springfield, Mass., manufacturer of sausage products, will move into new modern quarters June 1.

Hydrox Ice Cream Co., Chicago, is making improvements to its plant, costing $105,000.

J. D. Johnston, Jr., peanut-butter and mayonnaise manufacturer, recently completed and occupied a new plant at Brundidge, Ala., in which modern machinery had been installed. Production per day has been increased to one carload.

W. L. Jones Food Co. and Standard Brands, Inc., plants, Pemberville, Ohio, will operate this year, the former after an idleness of several years. The latter, after one year's idleness, will erect 50 brine tanks.

Fred L. Daggett and Frank Wrye are president and treasurer, respectively, and W. H. Belcher is general sales manager.

Muller Bakeries, Inc., Grand Rapids, Mich., has been renamed Michigan Bakeries, Inc., without change in capital or financial structure.

Ovson Egg Co., Chicago, has been renamed Sonov Egg Co.

Pacific-American Fisheries, South Bellingham, Wash., is reequipping and resupplying nine salmon canneries in Alaska and one in Washington at a cost of about $1,000,000.

Richmond (Va.) Dairy Co. is building a one-story brick addition to house its ice cream department, at a cost of $25,000.

Sheffield Ice Cream Co. and New York Dairy Maid Ice Cream Co., Brooklyn, have been combined in Dairy Pure Ice Cream, Inc. Henry J. Kolchin is president.

R. S. FLEMING

Director of the research laboratory, Borden Co., at Syracuse, N. Y., the 30th anniversary of his affiliation with his firm and its predecessors was celebrated April 3, at a banquet in his honor.

ARTHUR W. MILBURN

An office boy with Borden Co., New York, 40 years ago, he was elected president last month to succeed Albert T. Johnston, resigned. His former title was chief executive, a position now abolished.

Kellogg Co., Battle Creek, Mich., has announced permanent adoption of the six-hour work day after three years of operation. A minimum wage increase to men brings the minimum hourly rate to 67c. per hour.

Kroger Grocery & Baking Co., Cincinnati, has announced plans for a new meat processing and distributing plant at Cincinnati, adjacent to other company buildings, to cost $500,000. The two-story brick building, 180x130 ft., will house an automatic revolving smoke house.

Loose-Wiles Biscuit Co., Long Island City, has begun distribution of "Sunshine" chewing gum, a product of Sunshine Gum Co.

Walter M. Lowney Co., Cambridge, Mass., has been incorporated at $50,000.

Snider Packing Corp. catsup plant, Mt. Carmel, Ill., will operate this season after being idle since 1930. George B. Stein is manager. The firm has acquired the plant at Wayland, N. Y., formerly owned by New York Pea Packers, Inc.

Spreckels Sugar Corp., Yonkers, N. Y., was granted a 90-day extension by Federal Judge John C. Knox last month, for purposes of reorganization. The properties were to have been sold at auction when Rudolph Spreckels, president, charged conspiracy on the part of his competitors.

Stokeley Bros.' canning factory, Jeffersonville, Ind., will resume tomato

packing about Aug. 1, after being idle since 1931.

SWIFT & Co., Chicago, will open its new meat-distributing plant at Louisville early this month. The location has approximately twice the capacity of the former one.

VIRGINIA DAIRY Co., Richmond, is utilizing surplus skim milk by making powdered milk for chicken feeding.

WATERTOWN (Wis.) CANNING Co., idle last year, will pack peas this season, with F. C. Westphal, former president and general manager, Fall River Canning Co., as president.

WESTERN CIDER VINEGAR Co., Milton, Ore., is to be enlarged, its capacity of 500,000 gal. of vinegar and 15,000 gal. of pickles to be doubled. Sauerkraut and possibly tomato products will be added to the line.

PERSONNEL

EARL D. STEWART

Familiar to FOOD INDUSTRIES readers as former Pacific Coast editor, he is now in charge of production, Consumers' Yeast Co., Oakland, Calif.

STROUD JORDAN

Fellow of the American Association for the Advancement of Science, he will head Stroud Jordan Laboratories, New York, beginning June 1.

BYRON COX

Production manager at the Cox Baking Co. plant, Jamaica, N. Y., he was recently elected president of the New York Holes-in-Bread Club for 1934.

DONALD BARR

Formerly with British Canners, Ltd., in an advisory capacity, he has returned from England to be production manager, Frosted Foods Sales Corp., New York.

LAWRENCE ADLER has been appointed managing director, J. C. Adler Co., Joliet (Ill.) packing house.

ELLIS C. BAUM, former sales director, Continental Baking Corp., New York, has been elected vice-president in charge of the cake division, and H. EDWARD HILDEBRAND vice-president in charge of engineering.

HARRY N. BROWN, Worcester (Mass.) Baking Co., was elected president, Bakery Sales Association, at the Cleveland convention, April 9-10. ROBERT WEAVER, Freihofer Baking Co., Philadelphia, and GEORGE K. BATT, Dugan Bros. of New Jersey, Inc., Newark, were elected first vice-presidents.

W. W. CHENOWETH, head of the department of horticultural manufacturers, Massachusetts State College, Amherst, who has spent his sabbatical leave, beginning July 1, 1933, in studying the food industries of the Pacific Northwest and California, is expected to return about June 1.

HORACE G. DAVIS, since last October head of the cheese buying activities for federal relief, has begun his twelfth term as president of Wisconsin Cheese Exchange, Plymouth, Wis.

R. ADAMS DUTCHER, head of the department of agricultural biochemistry, Pennsylvania State College, is spending six months in Berlin, Germany, while on his sabbatical year of leave. He is engaged in vitamin investigation.

O. J. EARHART, J. W. Beardsley's Sons, Newark, N. J., was elected chairman of the code authority for the peanut butter industry last month. Code authority headquarters will be in New York.

ROBERT J. FLICK, chairman of the board, Franklin Ice Cream Corp. and Chapman Dairy, St. Louis, has resigned.

ALBERT H. FRIEDEL, formerly with the yeast and bakers' malt department, Anheuser-Busch, Inc., St. Louis, is now engaged in promoting a process for feeding yeast, on which the patent is pending.

JAMES A. GALLAGHER, JR., general manager, Union Meat Co., San Antonio, Texas, resigned April 1 from the firm, now owned by Swift & Co., to assume active management of Union Stockyards Co.

C. E. GRAY, Golden States Dairies, Chicago, was elected president, American Dry Milk Institute, April 20. WALTER PAGE, Borden Co., New York, was elected vice-president, and M. J. METZGER, Chicago, secretary-treasurer.

J. W. HORSEY, former vice-president, Standard Brands, Ltd., Montreal, has been elected president, to succeed Corwin Wickersham. When Standard Brands, Ltd., was organized in 1929, he became vice-president in charge of Fleischmann products division, and was later sales director for Chase & Sanborn.

STROUD JORDAN, managing director, Applied Sugar Laboratories, Inc., New York, formerly chief chemist, Henry Heide, Inc., and American Tobacco Co., will head Stroud Jordan Laboratories, Holland Plaza Bldg., New York, beginning June 1. The staff will act as general consultants to the confectionery, baking and tobacco industries, and as specialists in food and drug standards. Among Dr. Jordan's associates will be Katheryn Langwill, chemist, Applied Sugar Laboratories, Inc., formerly assistant chemist, Eskimo Pie Corp., who will engage in colloidal research work.

JOSEPH J. JURGENS, general manager, Austin (Texas) Baking Co., retired, has been succeeded by JOSEPH F. JAMES, formerly with Larabee Flour Mills Co., Kansas City, and Acme Flour Mills Co., Oklahoma City.

R. W. KING, manager, National Biscuit Co. branch, Des Moines, from 1928-30, is again manager there, succeeding J. B. Neenan, transferred to Kansas City, Mo.

FRED G. KREUGER, Pillsbury Flour Mills Co.; JOHN G. HOWELL, Hecker-Jones-Jewell division of Standard Milling Co., and MAX F. COHN, Sunset Feed & Grain Co., have been elected directors of the Corn Exchange in Buffalo.

W. L. KRUPPENBACHER, former director of sales, Mars, Inc., Chicago, has been named vice-president and general manager. L. W. LEONARD, auditor, has been appointed treasurer.

J. M. LIVINGSTON, former vice-president and general manager, Ward Baking Co., New York, has been elected president. JOHN W. HINES is now vice-president in charge of plants throughout the country, and ROBERT A. JACKSON, former Eastern district sales manager, is general sales manager.

L. R. MAXWELL, manager, grocery products department, Standard Brands, Inc., Chicago, is general chairman for the National Retailers' Convention program in June.

DONALD MACKENZIE and WALLACE D. STRACK have resigned from the board of directors, Borden Co., New York.

JOHN F. MOORE, special Department of Commerce prosecutor of Food and Drug Act violations, has resigned to take charge of enforcement activities in the general counsel's office, Federal Alcohol Control Administration.

WILLIAM R. MULLINS, formerly in the F. E. Booth Co. laboratory, Berkeley, Calif., is now in the technical control department, Consumers' Yeast Co., Oakland.

I. B. PORREMS, J. J. MACK and A. D. BENTLEY have been appointed managers of Armour & Co. plants at Peoria and Springfield, Ill., and Utica, N. Y., respectively.

SYLVAN L. STIX, Seeman Bros., Inc., New York, has been appointed a member of the Industrial Council by Governor Lehman.

V. A. TRACY, general manager, Purity Biscuit Co., Salt Lake City, has been appointed a member of the State Adjustment Board to hear and act on complaints of code violations.

IRA E. TRANTER will be superintendent of the Franklin (Ind.) Food Products Co. plant, recently purchased by Morgan Packing Co., Austin, Ind.

WILLIAM J. VERITO, vice-president and director, Cushman's Sons, Inc., and an executive of Purity Bakeries Corp., New York, has resigned from both firms.

R. B. and R. H. WAGSTAFF, former operators of Wiedeman's, Lawrence, Kan., are building a dairy plant, to be named Jayhawk Creamery, where ice cream, butter, grade A milk, cottage cheese and buttermilk will be produced.

FRANKLIN C. MARS
Mars, Inc., founder passes

DEATHS

WALTER C. DAVIS, 58, senior marketing specialist in charge of meat-grading and meat-grade standardization, Bureau of Agricultural Economics, at Alexandria, Va., March 27. His service with the Bureau began in 1916.

HERMAN W. HOOPS, 79, head of Hawley & Hoops, New York, April 18. Entering business with John F. Hawley in 1875, he had been head of the firm since 1914. One of the founders of the National Confectioners' Association, he was president in 1907-8, and held other positions of authority at various times. As founder and first president of the New York State Confectioners' Association, he labored to eradicate trade evils in the confectionery industry.

ARTHUR K. KETTLE, 65, vice-president and secretary, Jamestown (N. Y.) Baking Co., at Jamestown, April 6.

ABRAHAM H. KOTZEN, 58, treasurer and director, Charms Co., Bloomfield, N. J., at Miami Beach, Fla., April 17. His reorganization plan in 1921 resulted in the present company set-up.

GEORGE LONG, former president, Consumers' Biscuit Co., New Orleans, April 5. His presidency ended in 1932, when the firm was sold to Loose-Wiles Biscuit Co.

FRANKLIN C. MARS, 50, head of Mars, Inc., Chicago, at Baltimore, April 8. Entering the wholesale candy business at Tacoma, Wash., in 1910, ten years later he founded the Mar-O-Bar Co., Minneapolis. He introduced the "Milky Way" bar in 1923, and incorporated his company in 1927, moving it to Chicago in 1929. At the time of his death he was engaged in work on a specialty manufacturers' code, and was prominent in the affairs of the Specialty Manufacturers' Association.

JAMES MOORE, for many years with New York Canners, Inc., and Snider Packing Corp., Rochester, N. Y., at Ithaca, N. Y., April 11. He served as president, National Canners' Association, in 1922.

ARCHIBALD J. WALLACE, 70, for many years in charge of the kraut factories of Libby, McNeill & Libby, at South Haven, Mich., April 5. He was formerly secretary of the kraut section, National Canners' Association.

Associated Industries

CHARLES M. COX, president, New England Grain Products Co., Boston, has become a director of Corn Products Refining Co., succeeding Albert B. Boardman, deceased.

HEALTH PRODUCTS CORP., Newark, N. J., has begun work on doubling the present capacity of its cod-liver-oil concentrating plant. Completion is expected in the early autumn.

JAMES P. BOOKER
Former service manager, Nulomoline Co., New York, he now holds a similar position with Ross & Rowe, Inc. He is well known for his development of the uses of invertase and as an authority on candy making.

PFAUDLER Co., Rochester, has shifted its New York office from 8 West 40th St. to the McGraw-Hill Bldg., 330 West 42d St. The office and equipment display room will be in charge of W. E. Gray, Jr.

PHOENIX METAL CAP CO., Chicago, has opened an office in Baltimore, in the Keyser Bldg., with J. L. Zeman as representative.

PURE CARBONIC CORP., New York, has acquired the business and assets of American Dry Ice Corp., making it a wholly owned subsidiary under the name Dry Ice, Inc.

STEPHENS-ADAMSON MFG. CO., conveyor builder, of Aurora, Ill., has reopened sales engineering offices at Pittsburgh and Huntington, W. Va. The Pittsburgh office is in charge of Harry W. Banbury, purchasing agent and special sales engineer; the Huntington office is headed by G. W. Allen.

VOGT PROCESSES, INC., and VOGT INSTANT FREEZERS, INC., Louisville, have opened an Eastern office at 199 Main St., White Plains, N. Y.

BUSINESS TRENDS

Prices Again Up

Commodity prices during the latter half of March and first two weeks of April were generally stable, though marked by divergences in group movements. Meats, after falling decisively in late March, showed increasing strength in April. Grains and cotton suffered from favorable crop news, while steel and rubber mounted, the latter on the basis of restriction rumors.

Business activity reached its highest level since the spring of 1931 in the middle of April, after a moderate recession earlier in the month. Automotive and steel operations held their levels, while merchandise loadings, electric power and petroleum output showed gains.

The Business Week Index of business activity stood at 65.7 per cent of normal for the week ending April 14—1.3 per cent above the March 17 figure.

Wholesale prices reported by U. S. Department of Labor for the month ending April 14 were off 0.4 per cent to 73.3 from the figure of March 17, but were 22 per cent higher than on the same date last year. Farm products during the month dropped 1.5; manufactured foods, 1.9 per cent.

All commodities during the month ending April 21 advanced 1.1 per cent to 75.1 in the New York **Journal of Commerce** weighted price index, equaling the year's high of Feb. 17. Grain fell 6.4, but food rose 2.4 per cent.

Largest Pack Since 1925 Predicted This Year

In line with predictions at the January canners' convention in Chicago, the largest seasonal pack of canned foods since 1925 is forecast by experienced observers who have been traveling through the Middle West. At the meetings of the National Canners' Association it was constantly reiterated that, after a year of sizable profits in 1933, the normal expectancy would be greatly increased production. These fears, advanced as a logical basis for allocation of production through marketing agreements, have now been confirmed by surveys of actual production schedules. Tomatoes appear to be in grave danger. In Indiana, for example, it is reported that acreage will be increased from 30 to 45 per cent over that of 1933.

News of intentions to increase acreage by growers and canners has apparently caused considerable hesitancy on the part of buyers of futures. Distributors are aware of the danger of contracting for canned foods at prices to which the increased labor and raw material costs have been added by the packer. They know that the higher prices must be passed on to the consumer, whose resistance to higher prices than his slightly increased buying power justifies has been effectively demonstrated.

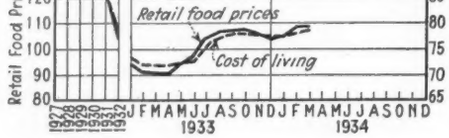
BASIS FOR THE CURVES

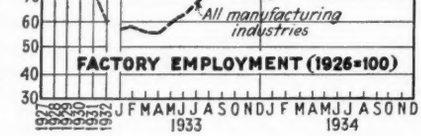
Retail food prices, factory employment, factory payrolls and wholesale prices are based on indexes of the Department of Labor. Cost-of-living index is that of the National Industrial Conference Board. Electrical-power-consumption figures are furnished by *Electrical World*.

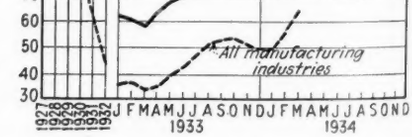
Tomato, Northwest Packs For 1933 Announced

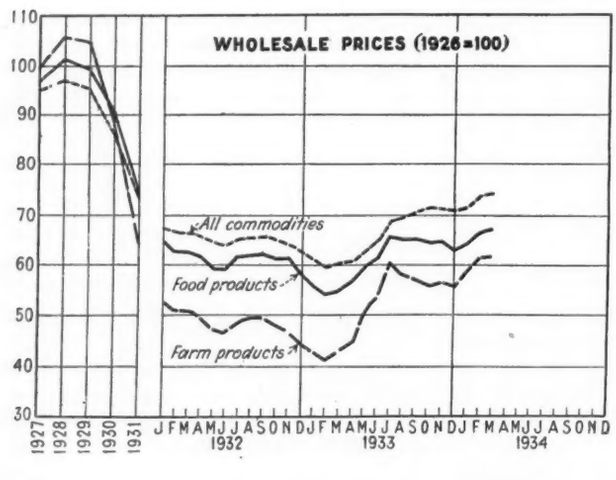
Canned tomato pack figures for 1933, exclusive of tomato products, show 17,896,332 cases of all sizes packed, equivalent to 11,896,469 cases of 24 No. 3 cans. The 1933 total pack is nearly 500,000 cases larger than that of 1932, on which data included complete reports from eleven States producing 72 per cent of the output. Figures are those of Foodstuffs Division, Bureau of Foreign and Domestic Commerce.

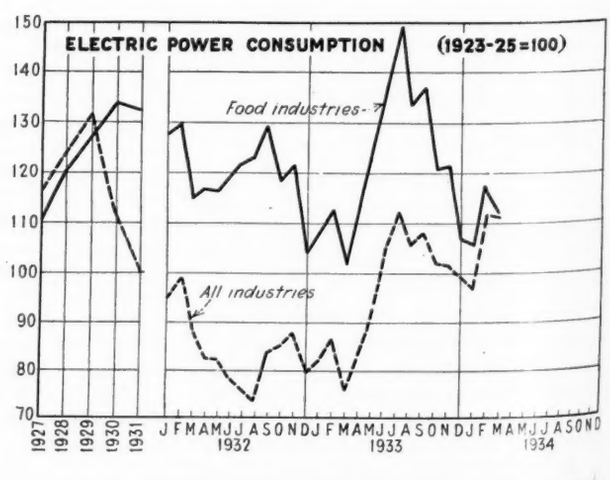
Total fruit and vegetable packs for Washington and Oregon during 1933 were 7,399,410 cases, of which 5,931,463 cases were fruits and 1,467,947 cases were vegetables. In totals for both fruit and vegetables, Oregon showed an increase of about 1,200,000 cases over the 1932 figure, 2,477,725, while Washington showed a gain of about half a million cases over the 1932 total, 2,991,286. Figures are those of Northwest Canners' Association.











Winter Wheat Production To Exceed 1933 Harvest

Winter wheat production of 491,793,000 bu. this year, as estimated by the Department of Agriculture, will be about 40,700,000 bu. greater than it was last year, 16,000,000 bu. greater than in 1932, but about 140,000,000 bu. less than the 1927-1931 average. Basing its estimate on the 41,002,000 acres sown last fall, the Crop Reporting Board made no allowance for abandonment under the A.A.A. reduction program. The condition of winter wheat on April 1 was estimated at 74.3 per cent of normal, compared with 79.2, the 1922-1931 average.

Wheat stocks on farms on April 1 were estimated at 114,647,000 bu., 21.7 per cent of last year's crop and 32,712,000 bu. less than were stored in 1932, when 24.6 per cent of the crop was stored. Acreage intentions reported to the Crop Reporting Board indicate reductions of about 2.5 per cent for wheat and 10 per cent for corn this season. On the other hand, there are likely to be increases as follows: 6 per cent for oats; 18 per cent for barley; 21 per cent for flaxseed; 16 per cent for beans; 7 per cent for grain sorghums; and 10 per cent for cowpeas.

Car-Loading Rise Expected

Shipments of 29 commodities are expected to require 10.7 per cent more freight-car space during the second quarter of this year than during the same three months of last, according to the estimate of Regional Shippers' Advisory Boards. Based on the forecast, sugar, syrup and molasses shipments from the Great Lakes region will be 20 per cent greater than last year's; livestock shipments will be up 10 per cent in the Southeast and 15 per cent in the Pacific Coast region; shipments of poultry and dairy products will be 10 per cent more in the Southeast, 16.1 per cent more in the Central West, and 23.8 per cent more on the Pacific Coast. Canned foods shipments should be 10 per cent greater from New England; 10 per cent greater from the Southwest; 30 per cent greater from the Southeast; 23 per cent greater from the Pacific Northwest; and 40 per cent greater from the Allegheny territory.

California Wine Output Exceeds 1918 Figure

California wine production is 25 per cent ahead of that of 1918, according to recent reports of the Bank of America. Although the 1933 vintage was about 5,000,000 gal. less than that of the average pre-prohibition year, the expected vintage for this year is estimated at approximately 60,000,000 gal., or 15,000,000 gal. more. Some 23,000,000 gal. on hand at the beginning of 1933 brought total gallonage available for market up to 63,000,000.

"Naked wine" and brandy produced in 1933 has been valued at about $28,000,000, whereas a slightly larger vintage in 1918 was worth $27,000,000. The estimated investment to date in the industry is $425,000,000, including $300,000,000 for vineyards, $50,000,000 for wineries and $75,000,000 for inventories.

Butter Stocks Again Fall

Storage holdings of butter on April 1 were 15,352,000 lb., about 6,000,000 lb. more than on that date last year, but less than 1,000,000 pounds above the 1929-1933 average. The reduction of stocks during March amounted to 21,501,000 lb., compared with 2,325,000 lb. removed from storage in March, 1933, and the 8,698,000-lb. average for the previous five years.

When government commitments to buy 9,200,000 lb. are completed, relief purchases will total 60,730,000 lb., or 85 per cent of the 69,000,000 lb. increase of stored butter in 1933 over 1932.

INDICATORS

SWEET CORN ACREAGE for 1934 will be 34.8 per cent greater than in 1933, it is estimated from reports of 157 representative corn canners on intended acreage. Three out of four canners indicated an intention to increase acreage.

DOLLAR VOLUME of 21 chain stores and mail order firms for the first three months of 1934 was just short of $600,000,000, 20.5 per cent greater than for the same period last year; A. & P. sales reached $205,867,737, up 6.25 per cent.

FOOD SPECIALTIES, such as olive oil, sardines and canned mushrooms, are being imported in 30 per cent smaller quantities this season than last, it is reported.

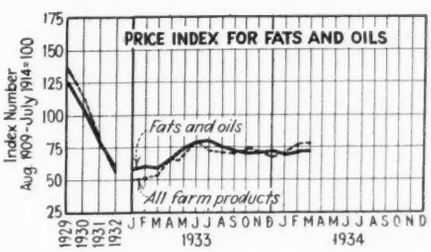
FLOUR PRODUCTION from July 1, 1933, to April 1, 1934, was 46,609,869 bbl., 9.3 per cent less than during the same period the preceding crop year. Production during March was 5,588,186 bbl., 1.5 per cent less than in March, last year.

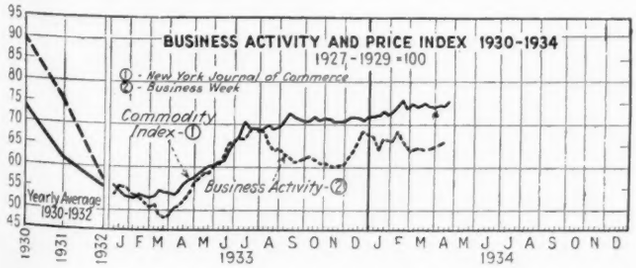
IMPORTATIONS OF WINE LEES, or argols, used in the manufacture of baking powder, cream of tartar, malt vinegar, Rochelle salts and related products, were 12,000,000 lb. in 1933, one-third less than in 1932. In 1920 imports were more than 35,000,000 lb.

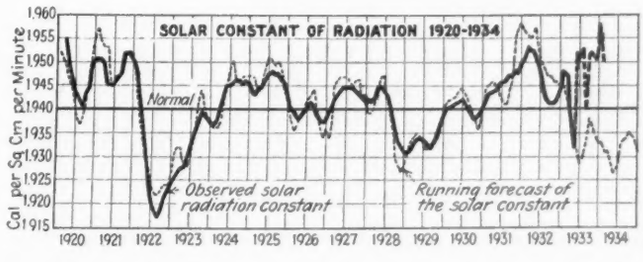
MILK PRODUCTION per cow as of April 1 was 12.65 lb., 5.0 per cent less than on April 1 last year and 9.3 per cent less than the 1929-1933 average. Total milk production was about 2.0 per cent less than on the same date in 1933, contrary to the trend for 1924-1933, when total production mounted 17.5 per cent. Largest declines in milk production per cow were noted in the Middle Western and South Atlantic States. Contrary to the trend during the period 1924-1933, milk consumption per capita in 1933 fell to 372 qt., the lowest figure since 1925, when per capita consumption was 369 qt.

CONSTRUCTION NEWS

	Pending (thousands)	Awarded April (thousands)	Total Awarded 1934 (thousands)
Bakery Products	$118	$29	$222
Beverages	528	572	4,138
Canning and Preserving	196	334	682
Confectionery	.....	18	133
Grain Mill Products	699	50	2,879
Ice, Manufactured	121	28	58
Meats and Meat Products	978	50	256
Milk Products	67	56	895
Sugar	.....	...	...
Miscellaneous	128	65	65
Total	$2,835	$1,202	$9,328






SOLAR CONSTANT OF RADIATION 1920-1934
Cal. per Sq. Cm. per Minute
Normal
Observed solar radiation constant
Running forecast of the solar constant

NEW METHODS ...PACKAGES ...PRODUCTS

Add the whisky and you have "rock and rye." This jar of rock candy by Rigney & Co., Brooklyn, N. Y., offers an unusual convenience. A recipe book goes with each package.

A built-in metal sifter enables the housewife to sift Pillsbury's Sno Sheen cake flour directly into the measuring cup, saving rehandling and waste. When pushed in, the sifter tightly recloses the box. The sifter costs so little that no increase in the retail price of the package was necessary.

Natural color and flavor of cashew nuts are preserved by N. B. Thakur, Mangalore, South India, by packing the nuts in a tin under a vacuum of 15 to 16 in. Before packing, the nuts are sterilized by gas.

Flaked Coffee Developed To Combat Staling

In an effort to solve that perennial problem of preserving the freshness of roasted coffee until it goes into the brewing pot, research fellows at Mellon Institute, Pittsburgh, have created a new product: flaked coffee.

The bugaboo of coffee roasters has always been the loss of the natural aroma by volatilization and oxidation and by its being carried away with the carbon dioxide. Ground freshly roasted coffee retains by occlusion approximately five times its volume of carbon dioxide, which slowly departs as the product ages, taking out a large proportion of the aroma. Even the vacuum tin does not stop this loss, as the occluded gas builds up pressure in the can and escapes when it is opened.

Produced by passing ground freshly roasted coffee through a roller mill under high pressure, the coffee flakes have about 90 per cent of the occluded gas expelled from them with practically no loss in aroma. And in this form, coffee has been kept fresh two years by sealing in carbon dioxide. As they come from the mill, the flakes are thin and flat, averaging about 0.06 in. in diameter and having a thickness of approximately 0.003 in. This flaking operation makes the soluble constituents of the coffee instantly accessible to the extracting liquid, and extraction not only is more rapid but it is also more uniform and complete. The flakes are said to yield approximately 50 per cent more extractive than the customary drip grind and from 75 to 100 per cent more than the ordinary percolator grind.

The research leading to the production of the new flaked coffee culminates from a broad study of the packaging of coffee begun in 1929 under the Can Fellowship sustained by Continental Can Co., Inc., New York. Patents cover the process.

Meats of the New Deal

Repeal has created a demand for new tidbits to be served with drinks. Always ready to please, meat packers have brought out miniature editions of their sausages and frankfurts. Adolf Gobel, Inc., New York, is packing cocktail-style pure pork sausage in 8-oz. tins. Stahl-Meyer, Inc., also of New York, produces both sausages and frankfurts in the cocktail size, packing them in 12½-oz. tins. These are prepared in the usual way and then canned in brine.

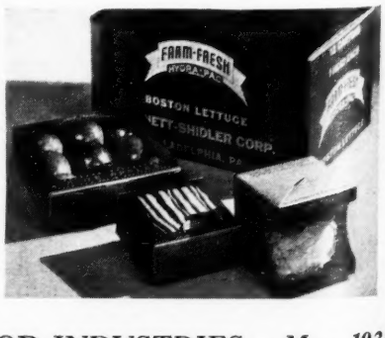
Applies Display Packaging To Vegetables, Fruits

Seventeen fresh fruits and vegetables packed in individual consumer cartons and displayed through transparent cellulose windows recently were placed on the market in Philadelphia by Kennett-Shidler Corp. These Farm-Fresh Hydra-Pac products follow the introduction a little more than a year ago of packaged celery, tomatoes and mushrooms by such firms as Schlesinger & Corso, Henry Kelly & Sons, Inc., and Atlantic Commission Co.

The waxed paperboard containers, with their display windows, serve a threefold purpose. They keep the products fresh and in good condition, make the items more attractive to the consumer and enable the distributor to trademark his goods and promote sales through advertising. While it costs the wholesale distributor more to pack fresh fruits and vegetables in this way, he benefits from an appreciable reduction in spoilage and waste, to say nothing of increased sales. As for the retailer, Kennett-Shidler state that on produce handled in the time-honored baskets, boxes, crates and barrels, the dealer's loss amounts to 25 to 50 per cent through false packaging, waste, spoilage, and price cutting to move produce that has been too long on hand.

So far, a number of the better stores in Philadelphia have taken to the new line, and the packers plan to add other items to their list.

The individual cartons and the corrugated shipping cases are manufactured by Robert Gair Co., Inc., New York.



An All-Glass Vacuum Jar; You Open It With Pin

Believing in de luxe containers for de luxe products, Hester Price, Riverside, N. J., is packing its fancy "Green Lady" specialties in an all-glass vacuum container. Cylindrical in shape, the jar has a wide mouth closed with a glass cap. The vacuum holds the closure in place, and the consumer opens the jar merely by inserting a pin, or other pointed instrument, alongside the rubber sealing ring. This breaks the vacuum and the cap lifts off. A notch in the edge of the cap makes it easy to insert a pin for opening.

Machines are not used to create the vacuum or apply the closure. Workers manually attach a spring clamp to hold the cap on while the product is processed and while it cools. Cooling creates the vacuum and pressure on the outside makes the seal. Although the container obviates vacuum and capping machines, this saving is offset by the additional labor required to apply the caps, Hester Price reports.

The containers illustrated have special green-glass caps with a knob for easy opening and reclosing. The standard cap, however, is less expensive, being of clear glass and flat on top. Using the special cap, and allowing for higher labor costs, Hester Price finds it necessary to charge 75 cents a dozen more for goods packed in this de luxe way than for the same product in an ordinary jar with a tin cap.

However, the container has strong consumer appeal, not only in appearance but for its reuse value.

This all-glass package is the product of Vacuum Jar Corp., New York.

New Food and New Name—Puréed; Not Purée

"It is not a soup and it is not a mash or a pulp, but it is a distinctive product distinctively named." In these words Van Camp's, Inc., Indianapolis, Ind., describe their "puréed" fruits and vegetables, which are prepared by finely dividing the products without crushing and expressing the contents of the cells. The company's claim for high nutritive value is based upon the contention that its process inhibits several undesired chemical reactions in cooking and in the can, minimizes loss of vitamins by oxidation and preserves the mineral salts. Of smooth consistency, the products supply bulk without roughness.

The new method of processing has been applied to apricots, prunes, mixed vegetables, tomatoes, peas, spinach and carrots. Dried "sulphured" apricots, to take only one product, are prepared by soaking over night, cooking in a closed kettle at about 91 deg. C. until soft and then sieving in a steam atmosphere. Sugar and hot water are added to regulate sweetness and consistency, and the batch is heated, filled into enamel-lined cans and processed.

Laminated Bag Satisfactory For Dried Skim Milk

Dried skim milk may now be packaged in small consumer units and kept on the grocer's shelves until sold without caking or spoiling. This is the conclusion drawn from limited tests by the Bureau of Dairy Industry of the Department of Agriculture. In these tests, the product was put up in a moisture-proof duplex laminated paper bag consisting of an outer bag of bond paper and an inner one made of two layers of glassine, with paraffin between the layers. Skim-milk powder in this container showed no signs of caking after four months' storage in the laboratory. Neither did it cake during three weeks in the laboratory and three weeks at 73 deg. F. and a relative humidity of 85 to 90 per cent. The severity of this test and the effectiveness of the bag used are seen from the fact that when the powder was packed in double bags with only an inner bag of glassine, caking occurred in 40 hours at 72 deg. F. and a relative humidity of 85 to 90 per cent.

Condensed Maple Syrup

By mechanically removing a large part of the sugar and water from maple syrup, Maple Producers' Cooperative, Quebec, Canada, manufactures a natural maple flavoring which does not cause the product to which it is added to be excessively sweet. It takes 2½ or 3 gal. of maple syrup to yield one gallon of this Canada-Strong flavoring, and the flavoring power of the product is reported to be strengthened by that proportion. American distributor for Canada-Strong is John G. Paton Co., Inc., New York.

Jewel Extract; Not Wesco

The tapering, broad-base extract bottles illustrated on page 133 of the March issue of FOOD INDUSTRIES were those of Jewel Tea Co. The caption erroneously gave Wesco Foods Co. as the users. Extract containers of similar design have been adopted by Wesco.

"More than a million dollars" was spent by W. K. Kellogg, Battle Creek, Mich., to develop the new Kaffee-Hag blend, so the product merits an effective container. This new lithographed can is that. The caffeine-free coffee is a Brazilian and Colombian blend

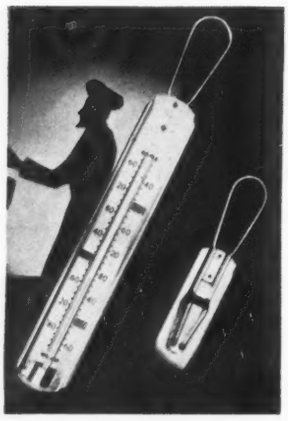
Nutro-Egg, a breakfast cereal recently developed by Milwaukee Macaroni Co., consists of gluten and egg yolk. The package permits the product to speak for itself.

There seems to be a trend toward glass containers for spices. Wm. Edwards Co., Cleveland, has gone to glass, adopting a jar with shaker cap that has a waxed liner. It is an Owens-Illinois container.

Cane molasses in powder form provides food manufacturers with a new material. Molaska Corp., Cleveland, dehydrates Louisiana cane syrup to produce this Molasco. It contains more than 80 per cent sugar and under one per cent moisture. Uniformity and ease of measuring and mixing are listed among its attributes.

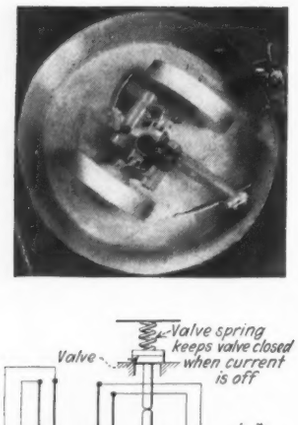
Paper Container For Dairy Plants

Easy to open and reclose, a sanitary leakproof paper container intended primarily for use in dairy plants has been developed by Reed Co., Inc., Grand Central Terminal Bldg., New York, N. Y. As shown in the illustration, it is closed with a metal clip. By removing this and pressing back two of the wings, a pouring spout is formed. To reclose, the spout is pressed back and the metal clip replaced. The container is made, sterilized, filled and capped on a special machine developed for the purpose. The machine, which is 22 ft. long and 4 ft. wide, is fed with heavy paper, which it paraffins. The paper container is meant for any substance which pours, such as milk, cream, cereals, salt, sugar and oils.



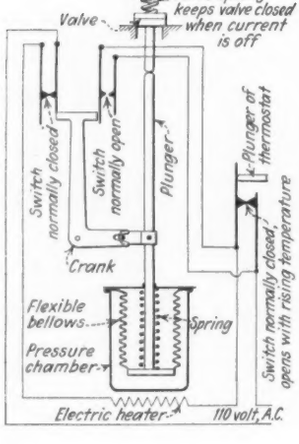
Thermometers

Sturdy, quick-reading and easy-to-clean are the three specifications applied to the newest thermometer marketed by Taylor Instrument Co's., Rochester, N. Y. When it is to be used for candy making (Confectioners' Thermometer No. 5807), the instrument has a range of about 50 to 370 deg. F. The model for deep-frying (No. 5909) has a range of about 60 to 500 deg. F. Both types have all metal parts of copper, including, as shown in the illustration, the clamp on the back for fastening the thermometer to the side of the kettle. The length of both models is 16½ in. over all.



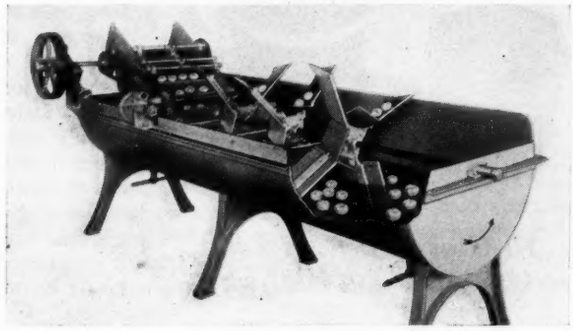
Intensive Mixer

Designed to mix dry, plastic or semi-plastic materials, an "Intensive Mixer" is being introduced to the food industry by National Engineering Co., 549 West Washington Blvd., Chicago, Ill. The mixer consists of a circular, stationary pan in the center of which is a turret in which revolves a vertical shaft driven through a set of bevel gears below the pan. A cross-head, mounted on the top end of the shaft carries mullers and plows. The mullers are mounted on rocker-arms so that they are free to raise and lower, with adjustments to provide a clearance up to 2 in. between the bottom of the muller and the pan. These plows turn the material over and direct it under the mullers. When mixing is completed, the material is discharged through an opening in the bottom of the pan by the action of the plows. The mixer is made in a wide range of sizes, one being designed for continuous operation.



Temperature Control

An electric "heat motor" supplies the actuating force in a temperature regulator now being offered by Wilbin Instrument Corp., 40 East 34th St., New York, N. Y. The "heat motor," a strip heater in a 110-volt a.c. circuit, is itself controlled by a thermostat, the plunger of which "makes" or "breaks" the heater circuit. If the temperature is low, the circuit closes, generating heat which vaporizes a volatile fluid and creates pressure in the actuating element of the valve regulating the flow of the steam, gas, oil or brine. As the pressure builds up, it compresses a bellows and opens the valve. When the valve plunger reaches the top of its stroke, a limit switch opens to interrupt the flow of current to the heater. The pressure chamber then begins to cool, and the valve reverses. A device for interrupting the electric circuit makes it possible to arrest valve control at any point between the "open" and "closed" positions. The thermostats are said to be sensitive to a fraction of 1 deg. F.



Low-Friction Belts

Pre-stretched vegetable tanned leather with high adhesion properties reduces the stretch and internal friction of the Monobelt, announced by Alexander Bros., 406 North Third St., Philadelphia, Pa. Thus, excessive elongation when the belt is bent sharply over a pulley at high speeds is compensated, and the life and efficiency of the belt are increased, according to the manufacturer. In single-ply belts, leather with a minimum amount of stretch is used, while in double-ply belts the outer ply is made of more elastic leather than the inner one. The latter construction obviates the tendency of the inner ply to crumple as the belt bends around pulleys.

Cleans and Fills

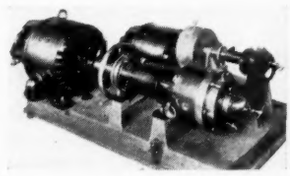
Bottles are both cleaned and filled by an automatic machine introduced by Pneumatic Scale Corp., Ltd., Norfolk Downs Station, Quincy, Mass. A straight-line conveyor carries the bottles into position and 20 at one time are moved sidewise into place under a vacuum cleaning nozzle. When clean, the containers move under the adjacent filling nozzles and then pass to a conveyor leading to the capper. This automatic machine may be geared to any capacity between 60 and 120 bottles per minute.

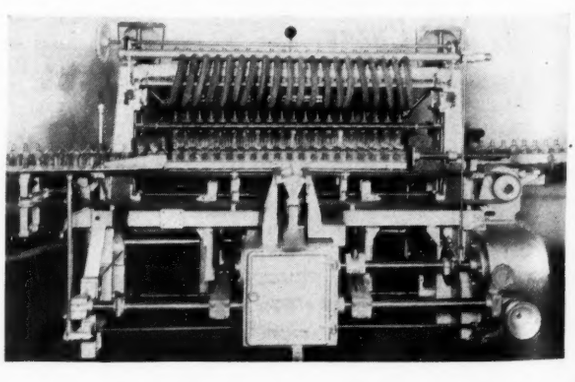
Tomato Washer

Fruit and tomatoes may be washed at the rate of eight tons or more an hour with a unit manufactured by Ayars Machine Co., Salem, N. J. The washing action is said to be sufficiently vigorous to remove larvae and decayed spots from tomatoes. The machine comprises a series of compartments in which paddles revolve on a horizontal shaft. These paddles pick up the fruit and transfer it from one compartment to the next, at the same time agitating the water. From the last compartment the fruit passes to an inclined conveyor chain that carries it underneath spray pipes and discharges it.

Emulsifier

Although built primarily to produce mayonnaise, the No. 15 Charlotte continuous mayonnaise machine developed by Chemicolloid Laboratories, Inc., 44 Whitehall St., New York, N. Y., permits the processing of salad dressing, French dressing, catsup, tomato juice and other emulsions as well. This versatility is made possible by a gear-shift arrangement and by an external adjustment wheel permitting the proper clearance for each product. The machine also extracts spice flavors and disintegrates solids while emulsifying. All parts coming in contact with the product are made of stainless steel. Occupying floor space, 50x58 in., the machine has a capacity of from 100 to 500 gal. per hour.





High-Speed Bread Wrapper

Twelve hundred to 2,000 sliced loaves per hour can be turned out by the "Speed Giant" automatic wrapper now being offered by Gellman Manufacturing Co., Rock Island, Ill. Taking loaves up to 6 in. high and 7½ in. wide, the machine is built in two sizes to accommodate loaves 14 and 18 in long. It handles the loaf from the bottom instead of gripping the sides or ends. The 14-in. model is powered with a ¼-h.p. motor, the latter with a ½-h.p. motor. Both models, with take-off board, are 13 ft. 3 in. long and 51 in. high; the widths are 33 and 39 in., respectively. Adjustment of the machine for various loaf-lengths is done by means of a crank on one side, which makes all major alterations for size. Either heat-sealing transparent cellulose or waxed paper may be used for wrapping without changing the heating plates.

Vertical Air Compressors

Designed to reduce installation and maintenance costs, a new line of vertical air compressors is being offered by Gardner-Denver Co., Quincy, Ill. Delivering the same quantity of air as horizontal models of equal capacity, they involve, the manufacturer states, 25 per cent lower original cost, 66⅔ per cent lower installation cost, and 25 to 50 per cent lower maintenance cost. It is further held that the vertical machines require less floor space than the horizontals. The four-cylinder verticals have capacities of 527 and 545 cu.ft. per minute, respectively, at 870 and 900 r.p.m.; the six-cylinder types have capacities of 790 and 817 cu.ft. per minute, respectively, at 870 and 900 r.pm. Floor space required for the four-cylinder type measures 68x54x52 in.; that for the six-cylinder types 102x59x52 in.

The Manufacturers • • Offer • •

Air Conditioning—Its industrial applications, including bakeries, candy factories, breweries and flour mills. B. F. Sturtevant Co., Hyde Park, Boston, Mass. Bulletin AC101, 11 pp.; well illustrated.

Compressors — Various air-cooled types and outfits. Gardner-Denver Co., Quincy, Ill. Bulletin Ac-7, 15 pp.; fully illustrated.

Brewery Equipment — Bottle washing, filling, crowning, pasteurizing and labeling machines. Liquid Carbonic Corp., 3100 South Kedzie Ave., Chicago, Ill. Series of four booklets, with careful explanations and meticulous illustrations.

Custom Equipment — Special processing equipment. Patterson Foundry & Machine Co., East Liverpool, Ohio. Booklet, 6 pp.; profusely illustrated.

Packing—"How to Pack It," for shipping. Hinde & Dauch Paper Co., Sandusky, Ohio. Booklet, 15 pp.; very well illustrated.

Packaging — Paper display bags. Continental Paper & Bag Corp., 220 East 42d St., New York, N. Y. Illustrated folder.

Package Machinery — Low-price equipment. Amsco Packaging Machinery, Inc., 122 Center St., New York, N. Y. Illustrated folder.

Scales—Industrial dial models. The Kron Co., Bridgeport, Conn. Catalog No. 7, 17 pp.; well illustrated.

Fumigant—Malium, a gas for fumigating a variety of products, including many foods. Michigan Alkali Co., 10 East 40th St., New York, N. Y. Booklet, 8 pp.

Coffee Granulator—For all-purpose grinding. Jabez Burns & Sons, Inc., 11th Ave. and 43d St., New York, N. Y. Well illustrated folder.

Malt Mill—The latest Buhler model, BMN Universal. Adolphe Hurst & Co., Inc., 330 West 42d St., New York, N. Y. Booklet, 6 pp.; illustrated.

Canning Equipment — The Standard Indiana Line, the Indiana pumpkin system, and special machinery and supplies. F. H. Langsenkamp Co., 227 East South St., Indianapolis, Ind. Catalog, 59 pp.; profusely illustrated. Each item carefully described, specifications being given in the majority of cases.

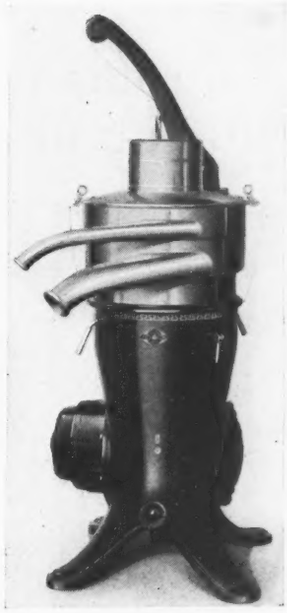
Chocolate—"The Confectioner's Handbook" and "The Ice Cream Handbook," the former regarding coatings and liquors, the latter chocolate and cocoa powders. Walter Baker & Co., Inc., Dorchester, Mass. Two booklets, 15 and 20 pp., respectively.

Staplers — For special uses. Bates Manufacturing Co., Orange, N. J. Illustrated folder.

Coolers—For water and other liquids. Frick Co., Waynesboro, Pa. Bulletin No. 153-C, 8 pp.; well printed and illustrated.

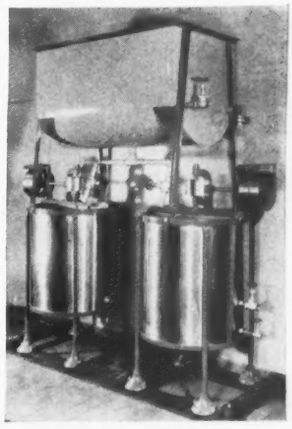
Separator Equipped With Bowl Hoist

An attached bowl hoist which eliminates manual lifting in removing the bowl for cleaning and replacing it is standard equipment on the No. 92 "World's Standard" model by DeLaval Separator Co., 165 Broadway, New York, N. Y. The hoist also serves to protect bowl, separator and workman from possible injury. The bowl is raised or lowered by turning a handle connected to the cable reel by a bronze gear. On the loose end of the stainless-steel cable is a ball-bearing swivel to which is attached a wedge lifter, which fits into the neck of the bowl and expands to lock itself in place. When the bowl is raised, the crane can be turned in its socket to clear the spindle. The bowl will remain suspended without locking the hoist.



Brine, Syrup System

First costs have been lowered by the curtailment of costs for construction materials in the brine and syrup system recently marketed by Sprague-Sells Corp., Hoopeston, Ill. The reduction in cost of materials is effected through the use of a plain, galvanized tank for preheating water, thus confining the contact of salt to the stainless-steel mixer. The boiling water is drawn down into the lower tanks for mixing. In the mixers all fittings except the pulleys are also of stainless steel.



Mixes Gas and Liquid

To effect a complete mixing of a gas and a liquid, the turbulence of a miniature water spout is put to work by the contactor manufactured by Blaw-Knox Co., Pittsburgh, Pa. Thus the gas is forced dynamically into intimate contact with the liquid, an advantage in gas washing, gas cooling, oxidation, hydration and steam desuperheating. Automatic and self-contained, the unit can be used on both batch and continuous processes; it will handle heavy fluids, even slurries. The construction of the contactor is shown in the accompanying illustration.

Temperature, Pressure Controls

To meet those operating conditions where dependable pressure or temperature control must be had at small cost, Foxboro Co., Foxboro, Mass., has developed a pair of compact control instruments. Similar in appearance, these controllers have a dial adjustment of the temperature or pressure. An indicating gage above the adjusting knob shows the air pressure on the diaphragm motor of the control valve and shows whether the valve is opening or closing. On the temperature controller, a 2-in. dial thermometer may be installed in place of the air gage to show the temperature being maintained. The pressure controller likewise may be equipped with a high-pressure indicating gage showing the pressure being controlled. In either case, it is necessary to mount a valve-motor air gage outside the case. All working parts of these instruments are integral with or mounted upon a cast aluminum base.

Controlling Cockroaches Not Difficult in Any Plant

(Concluded from page 217)

control materials generally are either in liquid or dust forms, although in plants, or often in certain parts only, where desirable foods may be scarce, an attractive poisoned bait placed near or in their nesting places will frequently prove very effective. In well-made brick or concrete buildings it often is possible to obtain an almost 100 per cent kill of all hatched roaches by fumigating. Cyanide usually is the gas employed, because of its cheapness and effectiveness (see formula No. 8[1]). Fumigation, however, requires that the entire room and generally the entire plant be treated, which, even when cyanide is used, often costs many times what ordinary control methods would entail. Besides, in all well-established colonies of roaches the unhatched eggs usually about equal the number of insects. As these are encased in a tough chitinous pouch, or capsule, and often at the back part of the nest, very few of them are killed by any reasonable fumigating dosage.

Roaches are not difficult to control in any plant. They are easy to kill, have definite habits and habitats, and, as stated previously, do not breed out in the open. If these facts are considered and only a reasonable amount of conscientious effort is made by the one fighting them, no serious trouble should be experienced even in the poorest of buildings. It is useless to spend time chasing single adult roaches. It is only one and probably came from a nest of ten thousand more. Also, spraying or dusting is useless where there are no roaches. Both are offensive in food materials or on equipment and cost money, so why put them in places where they are not effective? Roach nests are always best located at night with a flashlight by watching the young ones go in and out. When the nest openings can be filled with putty, cement or asphalt, that is the easiest way to stop them. When the openings cannot be closed, their interiors should be thoroughly dusted or sprayed. It frequently happens, especially in the older wood structures, that whole partitions or walls will become infested. These may have so many cracks in them that filling would be impracticable; they still will afford a relatively large cavity in which the roaches can multiply and where nothing but fumigation can reach. In some of these places where the nests cover considerable territory, periodic fumigation might be advisable, but in the majority of them tearing out of the section and rebuilding it permanently tight will prove the cheapest in the end.

One of the chief causes of roach trouble arises from lack of consistent and conscientious control. Roaches usually are entering the average food plant from outside during most of the year. They enter with raw materials and equipment, through the windows and doors, or in any number of ways. Periodic control gives these

Oriental Cockroach or "Black Beetle" (natural size)

newcomers an opportunity to become thoroughly established during the interim. There is nothing pleasant in the knowledge that roaches are in the plant, nor is it gratifying to contemplate the new ones that will come tomorrow, but there certainly can be no hopes of their numbers lessening unless some well-timed control measure is employed.

Although there may be no chance of a food plant being permanently rid of roaches, they are a reality, nevertheless, and one of the most insistent of pests; however, it would seem this melancholy fact in no way justifies any plant manager in passing either them or their filth on to the innocent public.

The type of control material to be used in fighting roaches should always be chosen to favor the particular plant using it. The type of food handled, the condition of the building, cost of materials and labor, and other pests encountered will have much to do with the choice.

The spray recommended for roaches is found in formula No. 1[2]. It should be applied with a hand atomizer, preferably what is known as the "compressed-air type." The powder used should be that of formula No. 2[2], and should be applied with a hand blower of a type that will deliver a uniform and penetrating blast. The poison bait recommended in formula No. 3[2] should be placed in or near the nest opening, when possible, but always under cover and out of the reach of other animals.

[1]FOOD INDUSTRIES, April, 1934, p. 160.

[2]FOOD INDUSTRIES, March, 1934, p. 113.

It Pays to Know Your Plant Operations

(Concluded from page 206)

check up on operations to see that they are being carried out according to the established standards.

In the last analysis, any new method such as this must be judged by its dollars-and-cents accomplishment. We have been working on the compilation of these descriptive and analytical studies and their application for two years. In that time production costs have been reduced better than 40 per cent as a direct result of improvement in procedure, better distribution of work, and elimination of duplication and haphazard routine. Furthermore, it has produced improved working conditions for our employees and made their steady employment more certain, as we have been better able to meet prices.

Such an accomplishment in the light of present-day business conditions is encouraging because the economic fate of many companies in all industries has hung in the balance of production costs and employee morale. To me it marks a definite transition in the milling industry and, perhaps, in other industries as well. Heretofore, the "rule-of-thumb" method of management has been considered imperative in correct milling. Both mechanical and chemical innovations have been readily accepted, but scientific management and production control have been deemed too remote and inflexible to be applied to the industrial "art" of milling. The proof of our pudding is that we have made a 40 per cent reduction in production cost and are today operating with practically the same force we had two years ago.